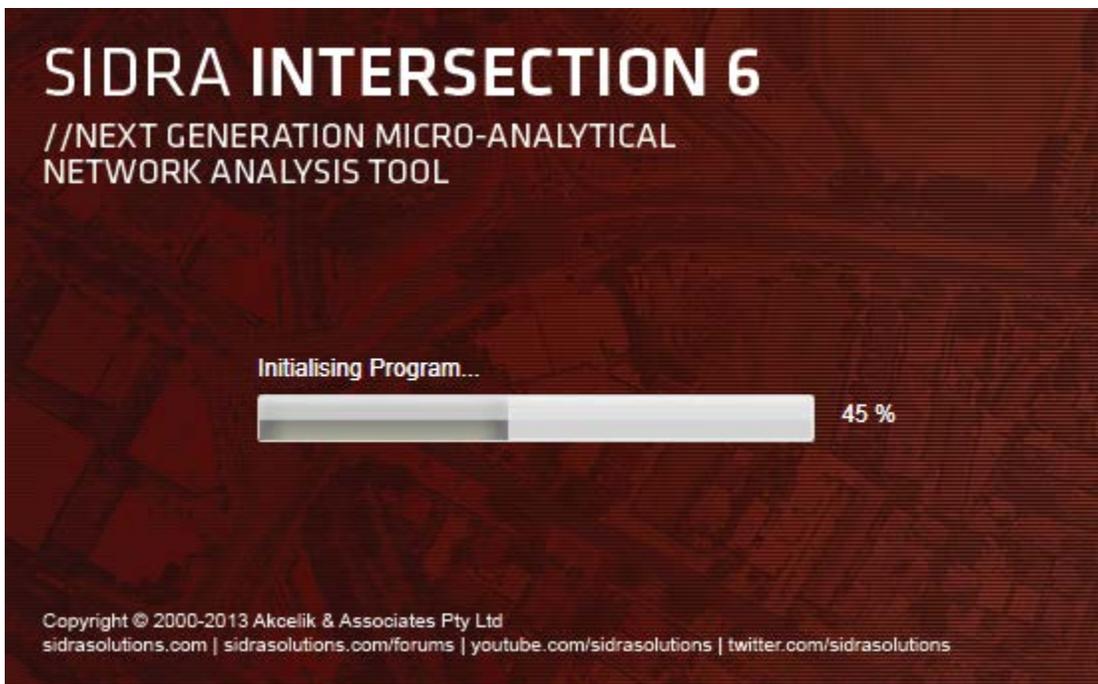


Getting Started: SIDRA



Version 1.0
September 27, 2013

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I. INTRODUCTION

This guide will provide a basic understanding of how to use the Sidra 6 software package. This guide was designed to walk a user through the necessary steps to analyze a single roundabout. It will also cover how to use Sidra 6 to perform a comparison between a roundabout and a signal or a stop control.

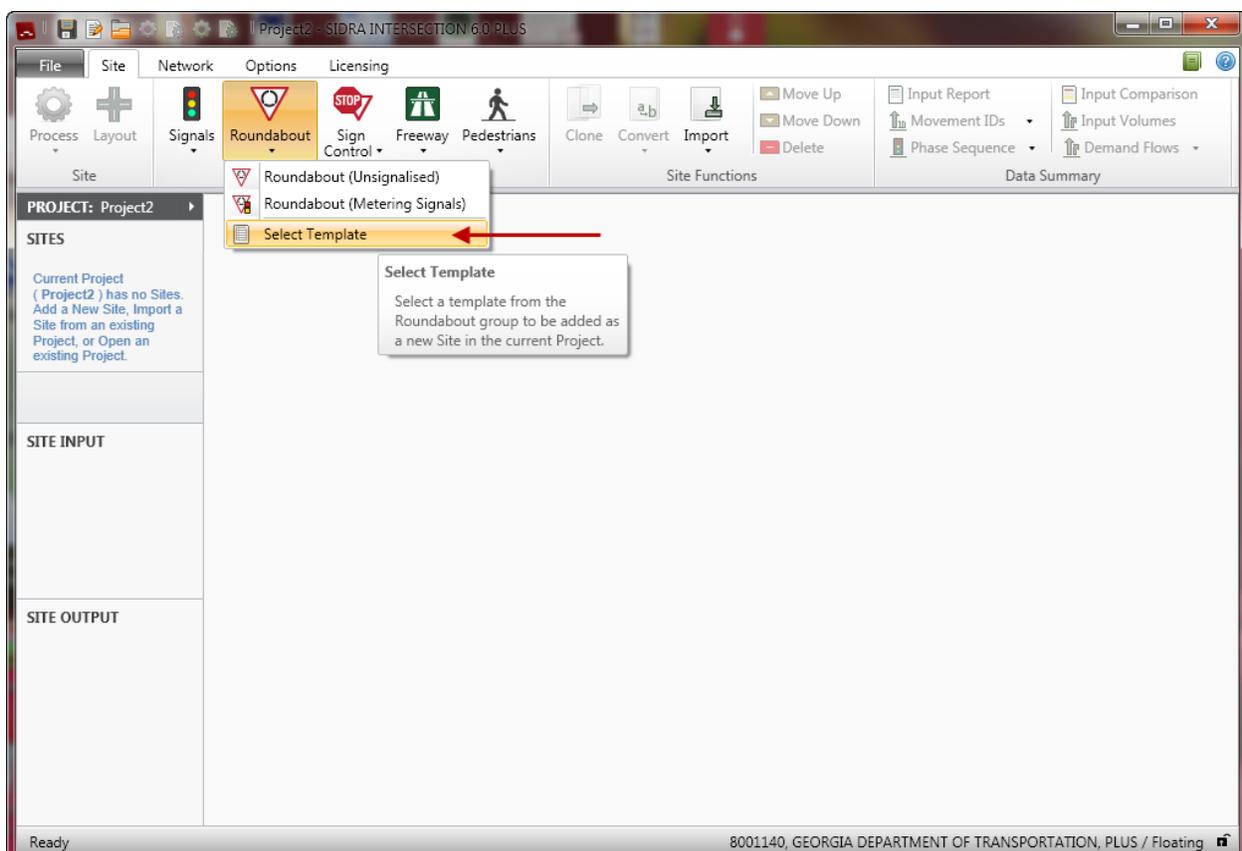
Please contact Tiffany Turner (tturner@dot.ga.gov) if you have any questions, suggestions about this guide or if you notice any errors or discrepancies in this guide.

II. CREATE ROUNDABOUT PROJECT

1. Open Sidra (click icon)

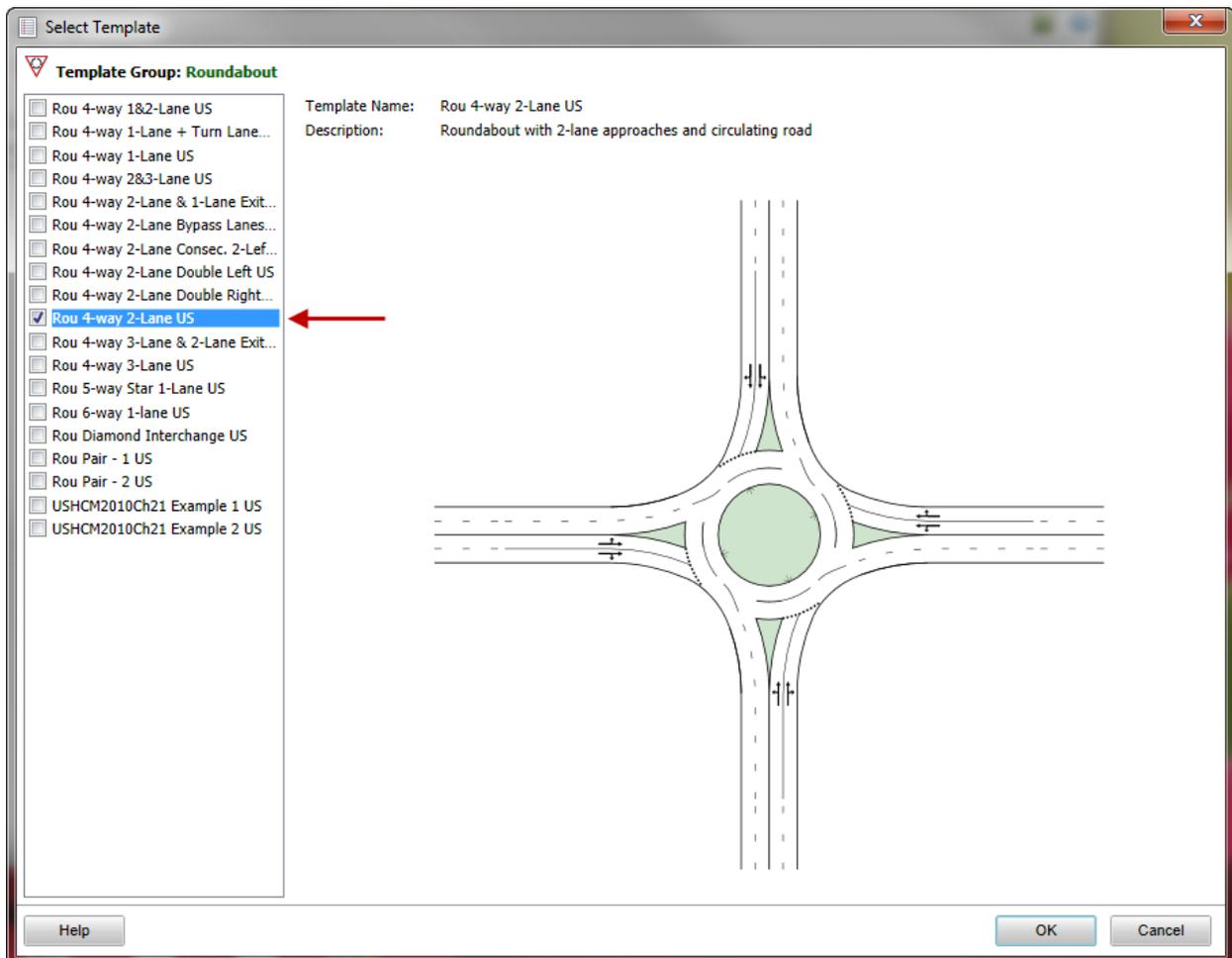


2. Select the **Site** tab from the Menu bar. Then go to > **Roundabout** > **Select Template**



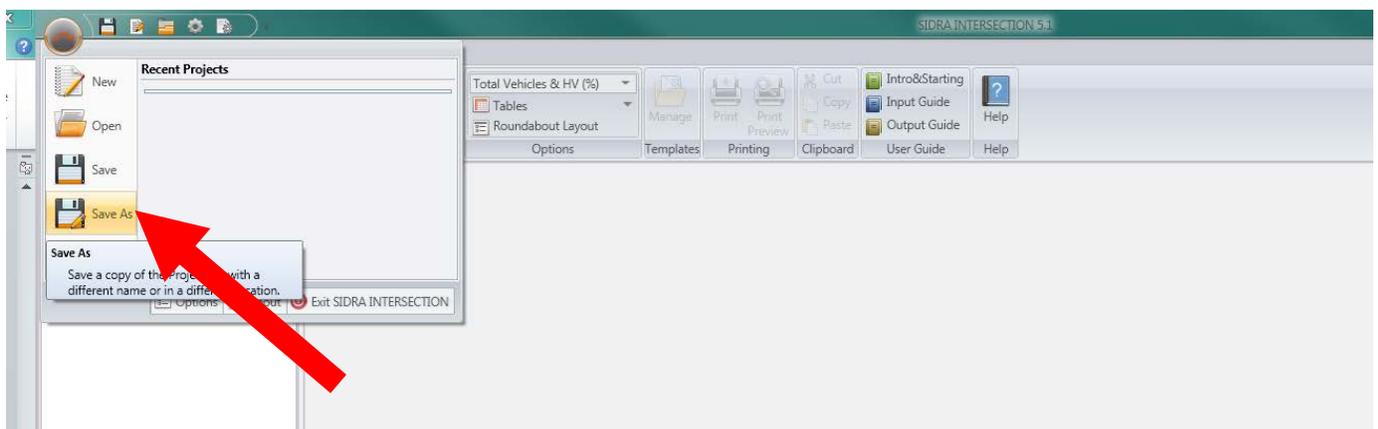
3. Select **Rou 4-way 2-Lane US** from the template list. Click **OK**

** Select whichever template that matches the project to be analyzed. Use the diagram as a guide*

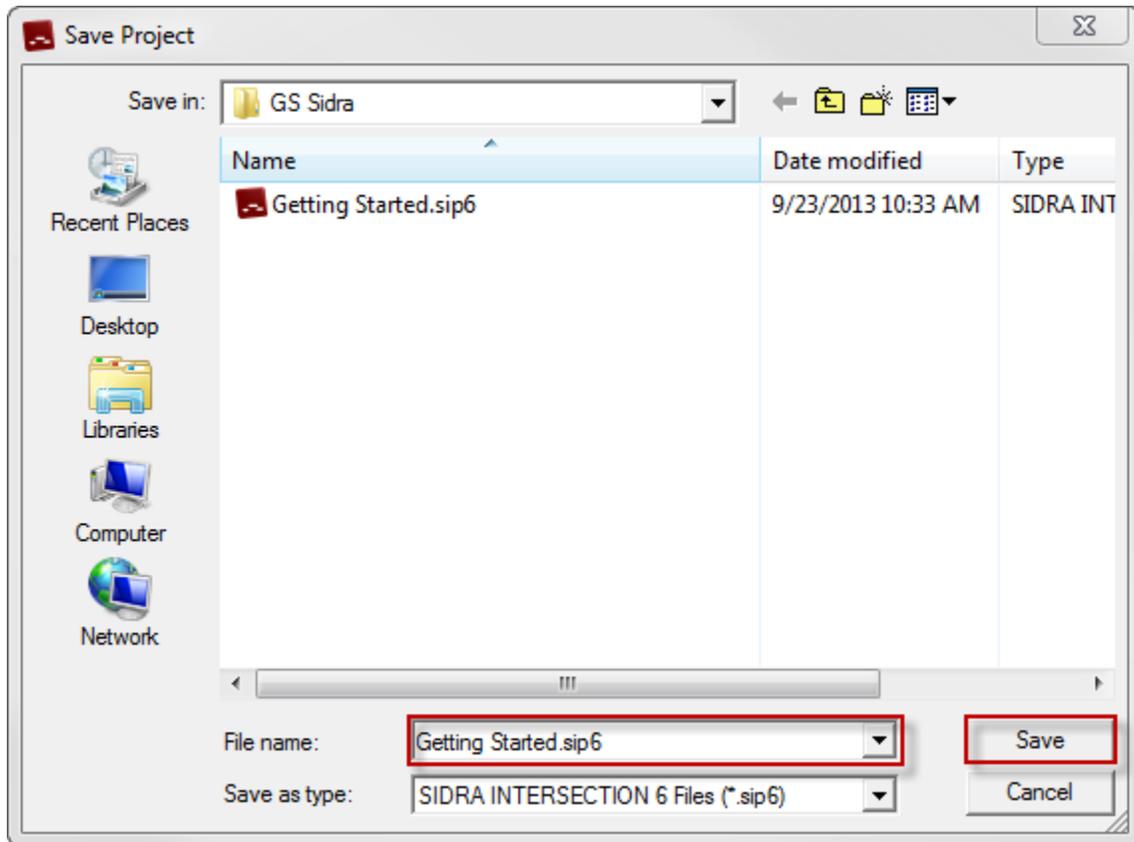


4. Save the project file

a. File > Save as



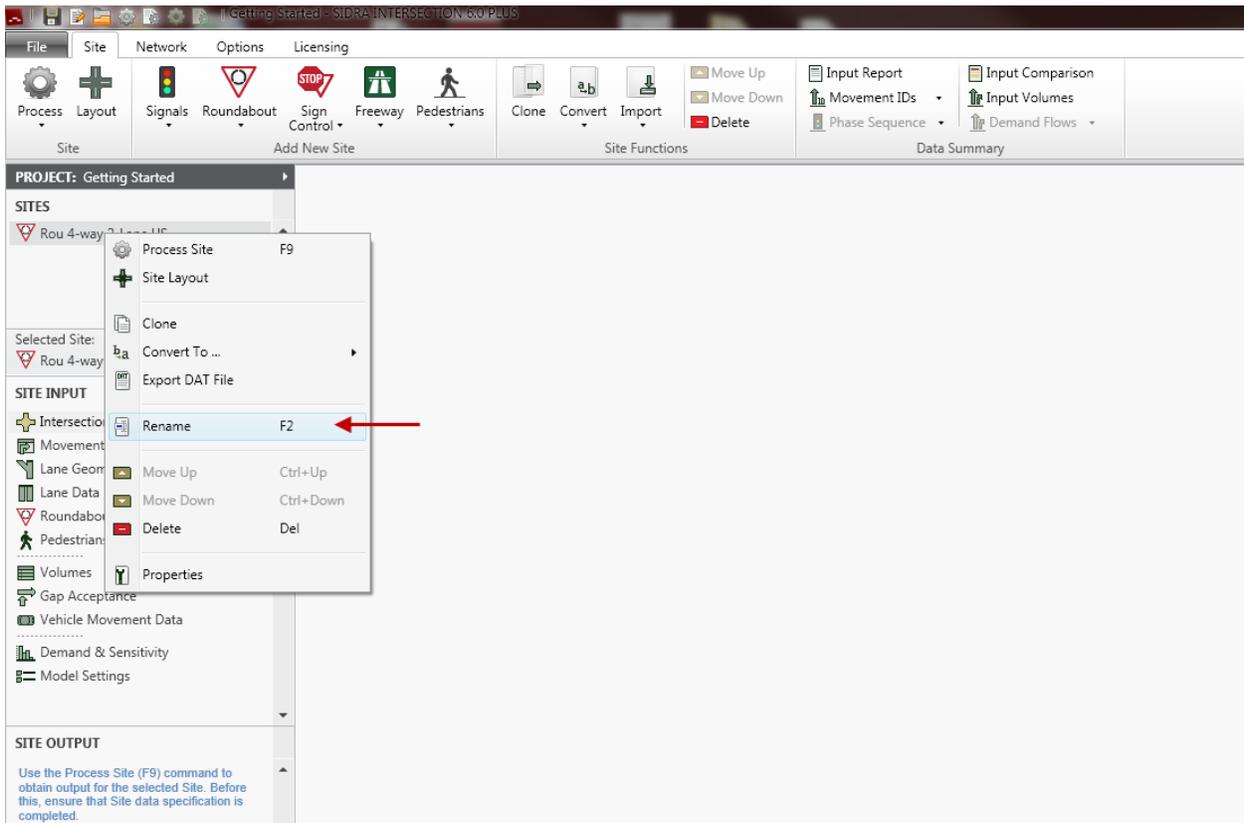
b. Name the file and **Save**



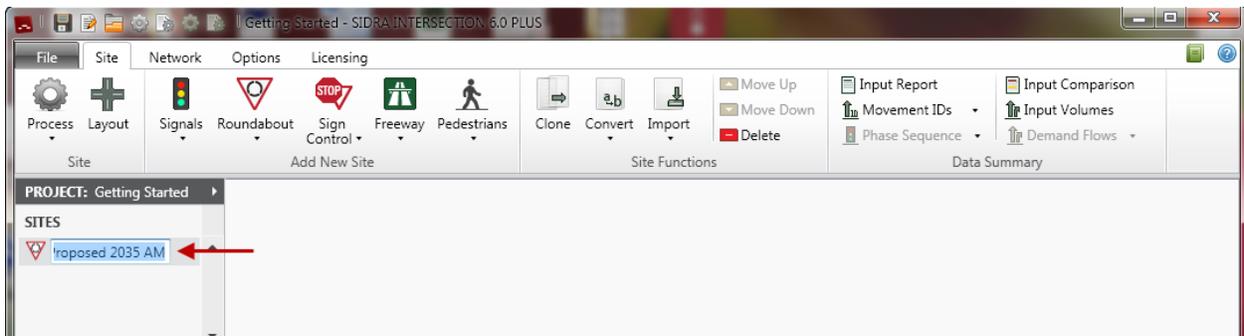
**rename the project the PI number or the project name*

5. Rename the Template

- a. Right click on “Rou 4-way 2-lane US” > select **rename**



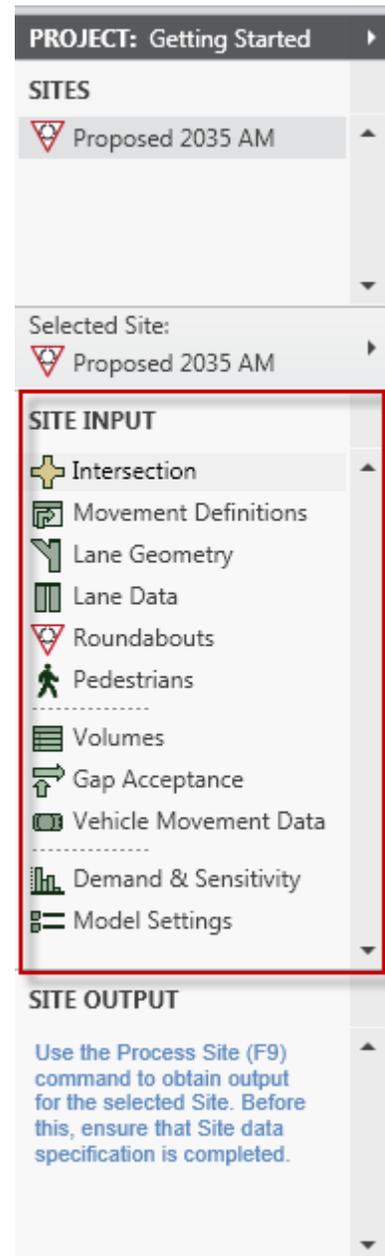
- b. Rename the template rename the site by alternative, traffic count, geometric configuration, etc...



III. INPUT DATA

Go to **Site Input** in the side bar.

- Intersection
- Lane Geometry
- Roundabouts
- Volumes
- Vehicle Movement Data
- Model Settings



Intersection

INTERSECTION - Proposed 2035 AM

Intersection Properties

Quick Input

Approach Editor

Site Data

Approach Geometry

Approach Data

Selected Leg: South

Legend

Dialog Tips

Help OK Cancel Apply Process

1. Site Data

- Site Name:** Alternative
- Site Title:** Enter the PI number, project description, county and alternative (traffic year, traffic time, geometric alternative)
**Note: Being specific is important as it allows the reviewer to clearly identify what is being analyzed in the reports.*

2. Approach Geometry

- Select a leg (will be highlighted in red)
- Name:** Approach road name
- Leg Geometry:** select
 - Two Way:** two way traffic
 - One-way Approach:** one lane entering *ex. off ramp*
 - One-way Exit:** one leg exiting *ex. On ramp*
 - No Leg:** removes leg

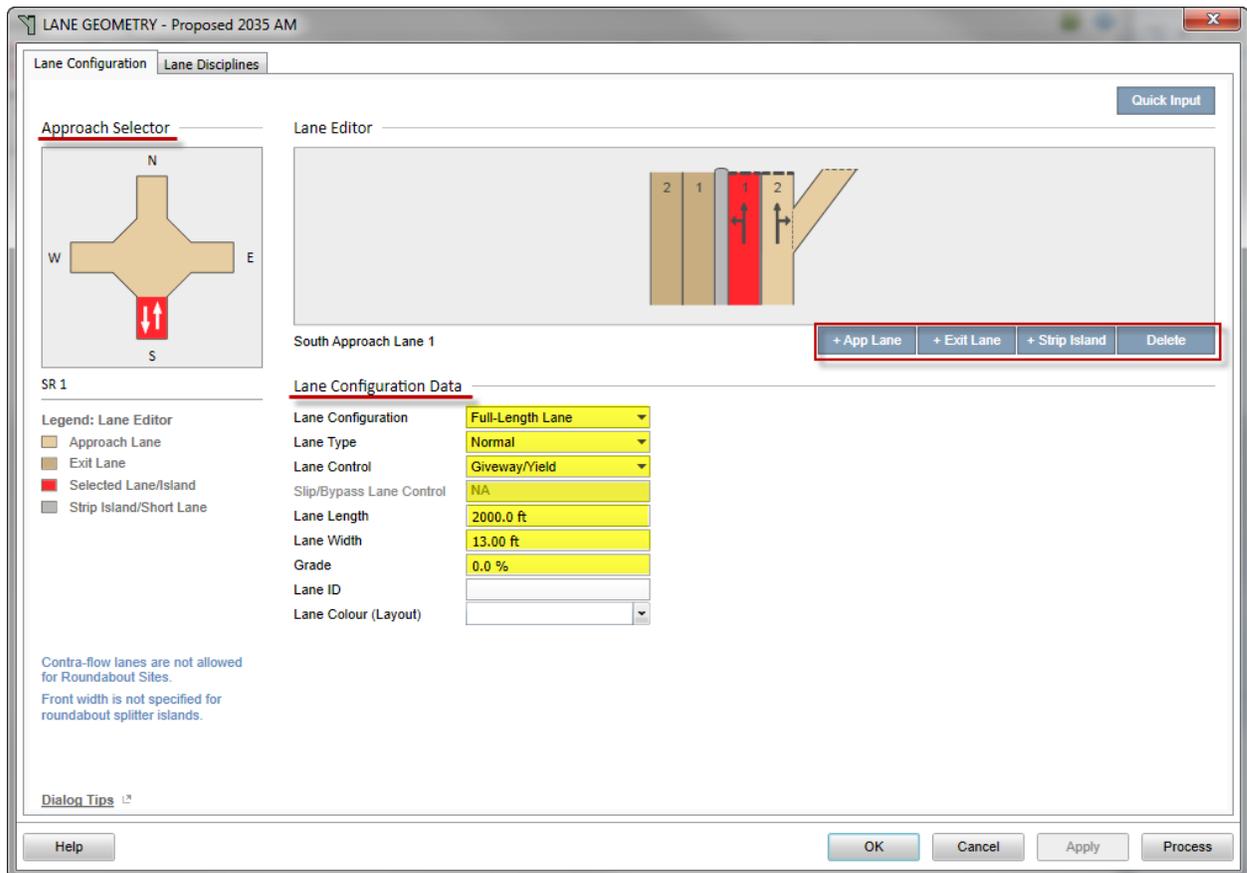
3. Approach Data

- Approach Distance:** distance to upstream or downstream intersection

4. Repeat steps 3 & 4 for each approach and click **Apply**, then **OK**

**use F2/Shift F2 to toggle between approaches*

Lane Geometry



I. Lane Configuration Tab

1. Lane Editor

- Select an approach from the **Approach Selector** diagram
- Select “+ **App Lane**” or “+ **Exit Lane**” to add lanes to the selected approach
- Select **Delete** to remove the selected element

2. Lane Configuration Data

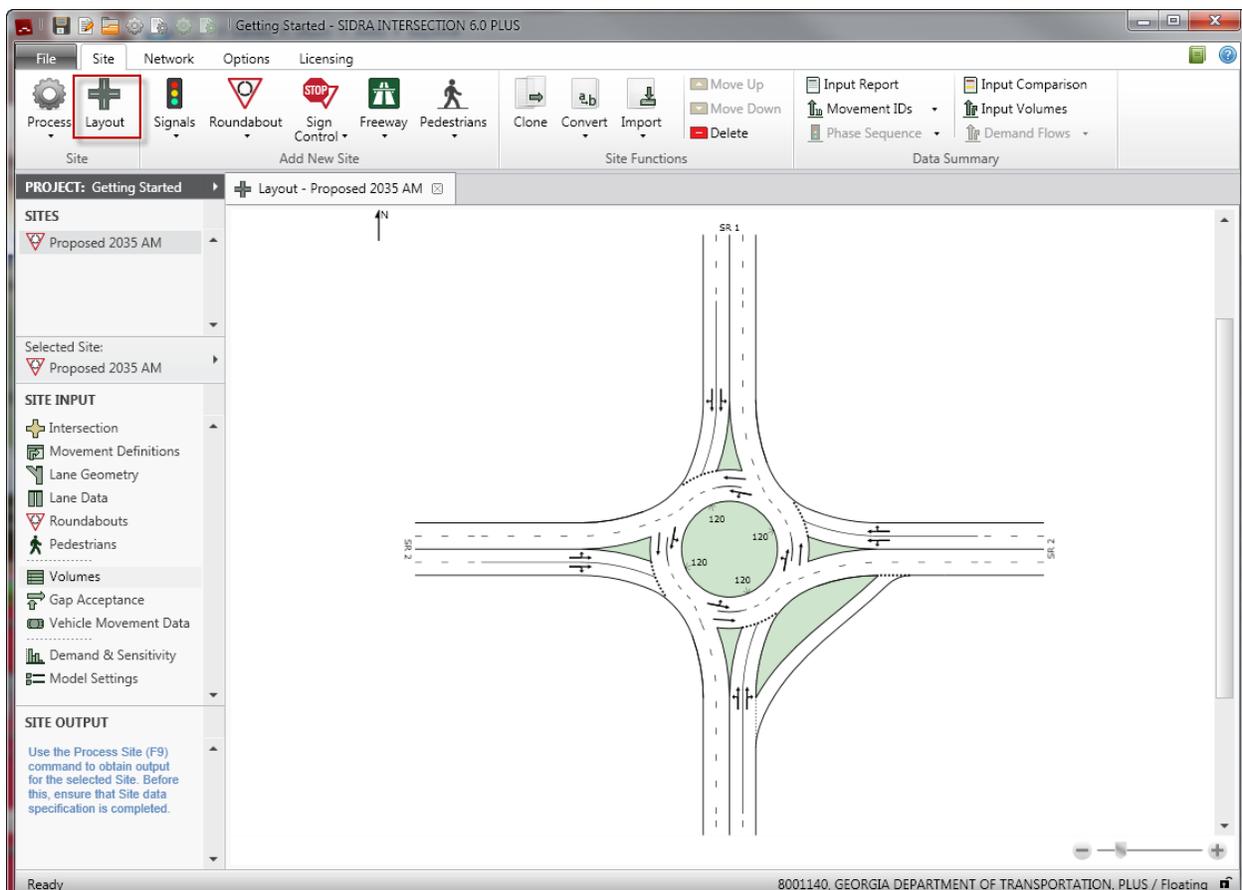
a. **Lane Configuration :**

- Full-Length Lane:** any lane with a length equal to the approach leg length
- Short Lane:** any lane with a length less than the approach lane length (*ex. turn bay*)
- Short Lane w/parking:** ignore
- Two Segment Lane:** ignore

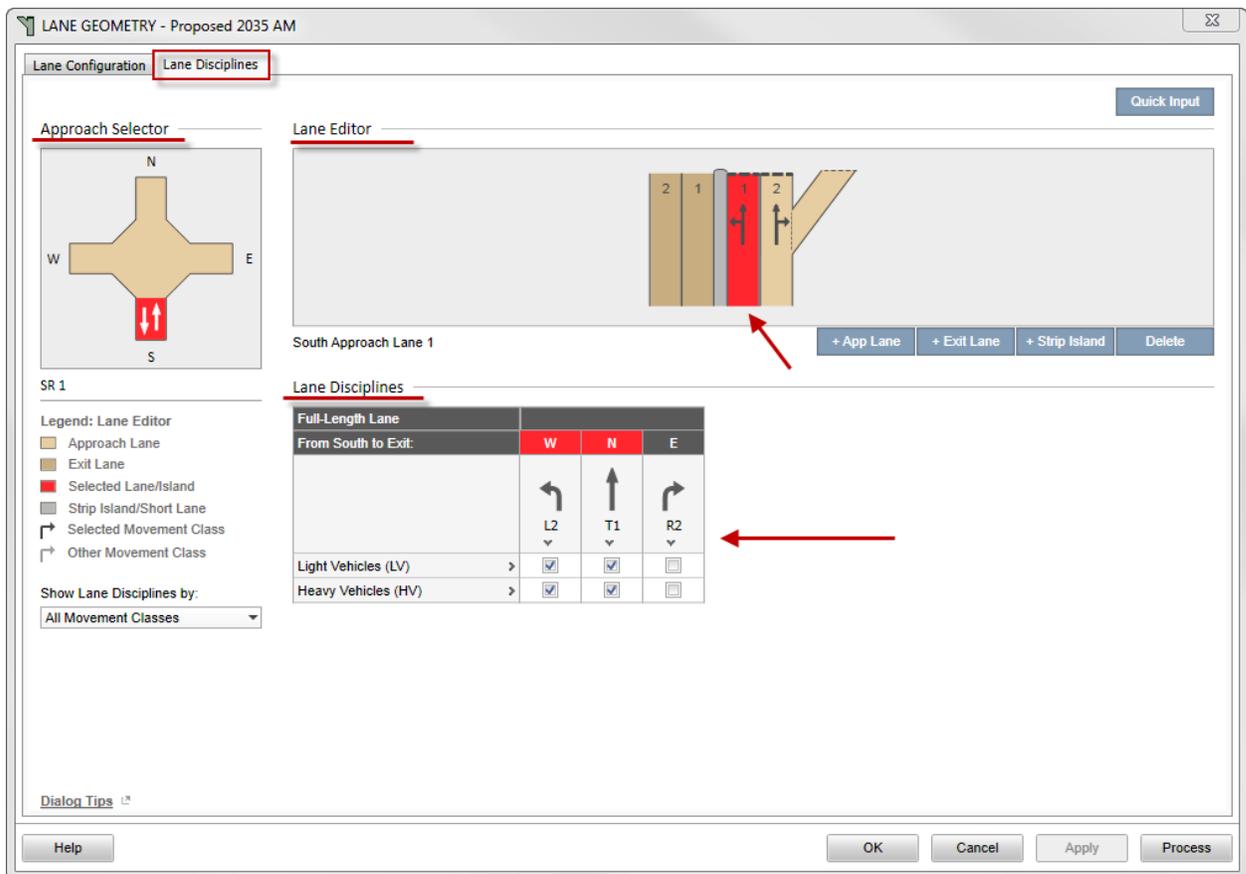
b. **Lane Type:** (see SIDRA help for a diagram)

- Normal:** default
- Slip/Bypass (High Angle):** a lane that bypasses the RAB at a high angle, usually separated by an island, but merges back in with exiting traffic on exit lane

- iii. **Slip/Bypass (Low Angle):** a turn lane that bypasses the circulating lanes at a low angle, usually separated by an island, and has an exclusive lane on the RAB exiting leg
 - c. **Lane Control:** select Giveway/Yield
 - d. **Slip/Bypass Lane Control:** (select only if a slip lane is present)
 - i. **Giveway/Yield:** bypass traffic must yield to circulating traffic (High Angle Slip Controlled leg)
 - ii. **Continuous:** bypass traffic has free flow into an separate exit lane (Low Angle Slip Controlled leg)
 - e. **Lane Length:** do not change
 - f. **Lane Width:** enter lane width (Ft)
 - g. **Grade:** enter grade in percent (%)
3. **Short Lane Data**
- a. **Short Lane Length:** enter the length of the turn bay (from the furthest point a vehicle could fully enter the lane)
 - b. **Overflow Direction:** which direction does the traffic back up in; left, right or both.
Go to help to see diagram.
4. Repeat for each lane in each leg (*use F2/Shift F2 to toggle between approaches*)
5. Select **Apply**, then **OK**
6. Select **Layout** from the **Site** tab in menu bar to confirm the desired lane configuration was entered.



II. Lane Disciplines Tab



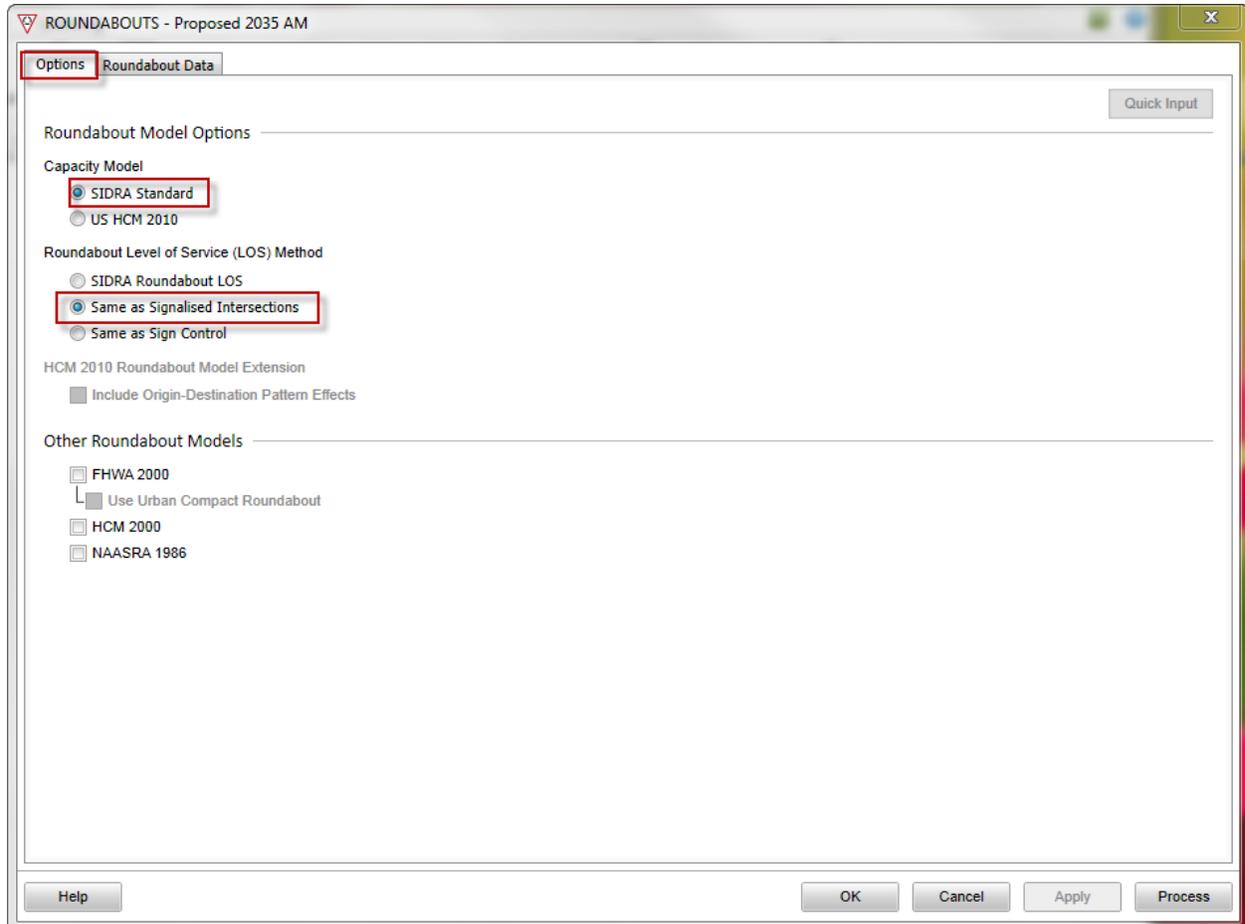
1. Lane Disciplines

- Select an approach from the **Approach Selector** diagram
- Highlight an approach lane in the **Lane Editor** diagram
- Check to select the movements for the highlighted lane
- Repeat for all lanes on approach
- Repeat for all approaches

Roundabout

1. Options Tab

- a. **Capacity Model:** Select **SIDRA Standard**
- b. **Roundabout Level of Service (LOS) Method:** Select **Same as Signalised Intersections**



2. **Roundabout Data** tab

a. Geometry

- i. **Number of Circ Lanes:** enter the number of lanes that pass the splitter island of the leg selected
- ii. **Circulating Width:** enter the width of the circulating lanes
- iii. **Island Diameter:** enter the diameter of the of the center island
- iv. **Entry Radius:** enter the radius of the curb of the entry lane
- v. **Entry Angle:** the angle of the entry lane to the circulating lane

b. Calibration

- i. **Environmental Factor:** enter 1.2

The screenshot shows the 'ROUNDABOUTS - Proposed 2035 AM' software window. The 'Roundabout Data' tab is active. On the left, a 'Site Display' shows a roundabout diagram with North (N), South (S), East (E), and West (W) approaches. Below it, it says 'Current Capacity Model: SIDRA Standard'. On the right, the 'Geometry' table is displayed:

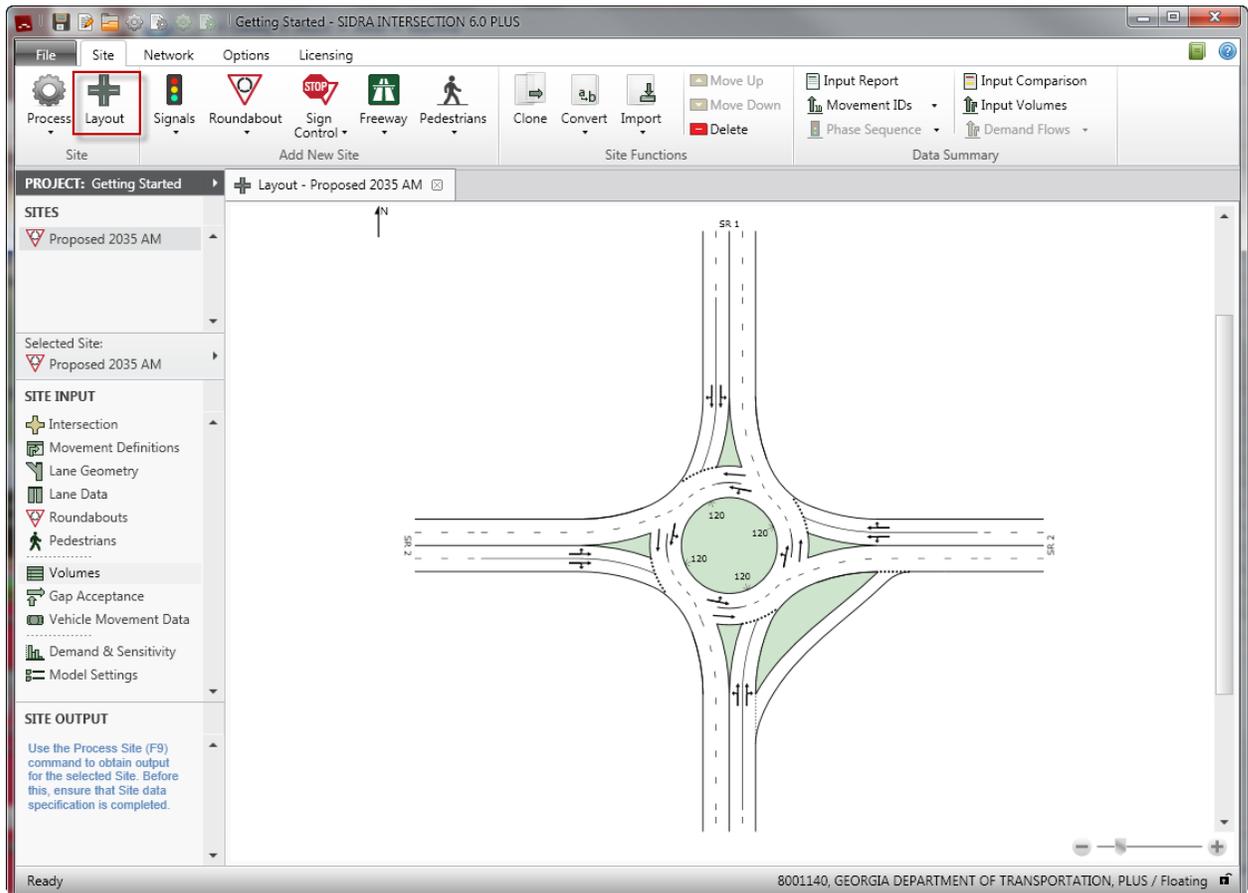
Approach:	S	E	N	W
Number of Circ Lanes	2	2	2	2
Circulating Width	30.0 ft	30.0 ft	30.0 ft	30.0 ft
Island Diameter	120.0 ft	120.0 ft	120.0 ft	120.0 ft
Inscribed Diameter	Program ▾	Program ▾	Program ▾	Program ▾
Entry Radius	60.0 ft	65.0 ft	60.0 ft	65.0 ft
Entry Angle	30.0 °	30.0 °	30.0 °	30.0 °
Raindrop Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Circulating Transition Line	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Number of Downstream Circ Lanes	Program ▾	Program ▾	Program ▾	Program ▾

Below the Geometry table is the 'Calibration' section:

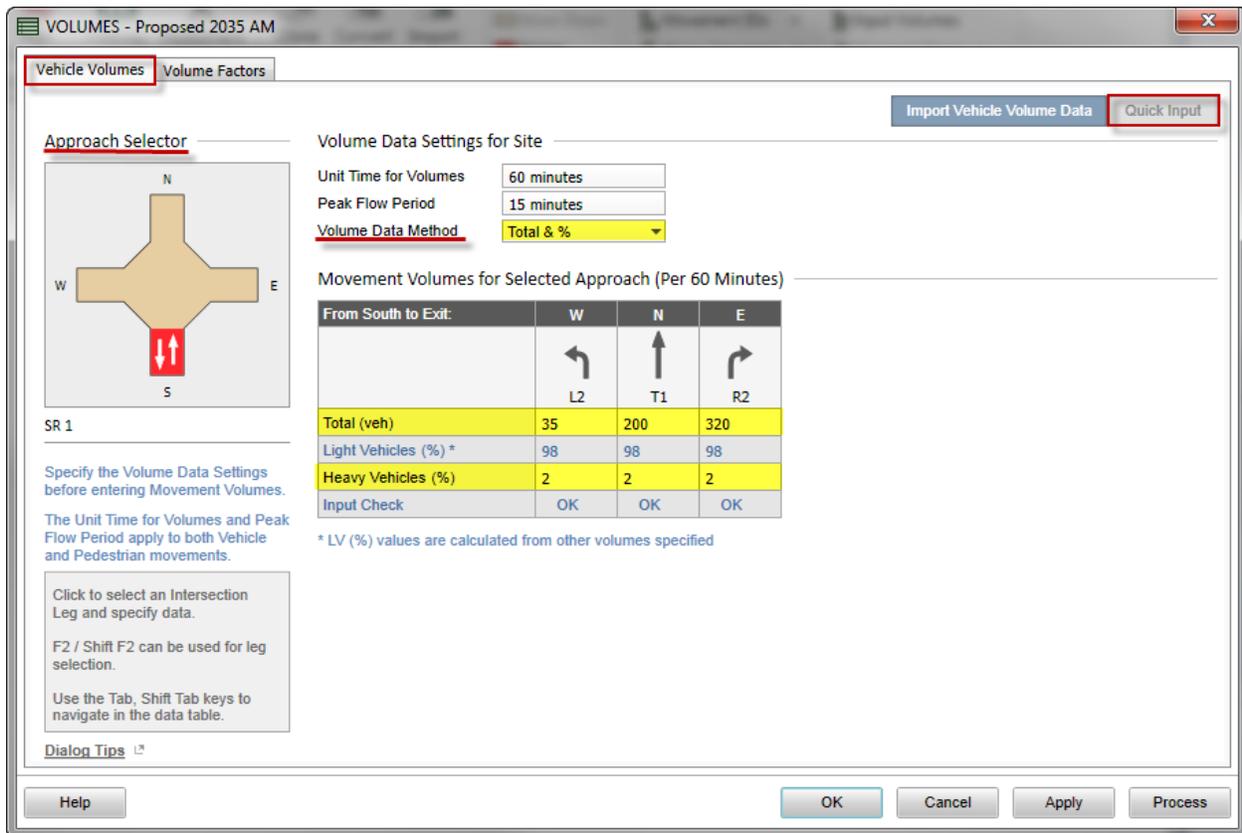
Approach:	S	E	N	W
Environment Factor	1.20	1.20	1.20	1.20
Entry/Circ Flow Adjustment	Medium ▾	Medium ▾	Medium ▾	Medium ▾

At the bottom of the window, there are buttons for 'Help', 'OK', 'Cancel', 'Apply', and 'Process'. A 'Quick Input' button is also present in the top right corner of the data area. A tip box says 'Use the Tab, Shift Tab keys to navigate in the data table.' and there is a 'Dialog Tips' link.

3. Select **Layout** from the **Site** tab in menu bar to confirm the desired lane configuration was entered.

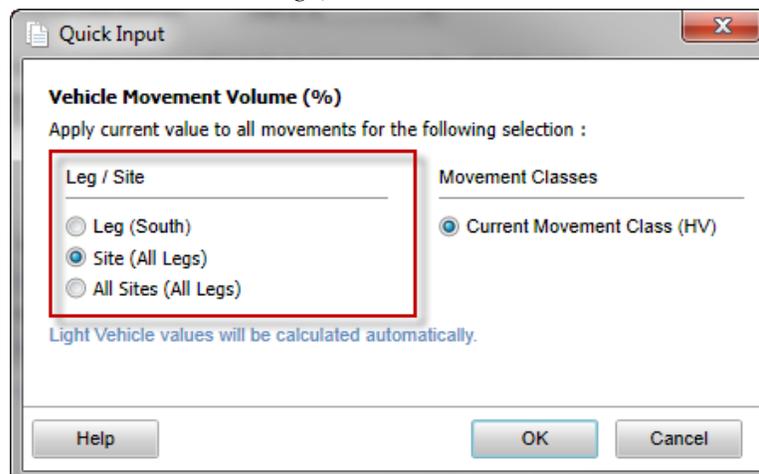


Volumes

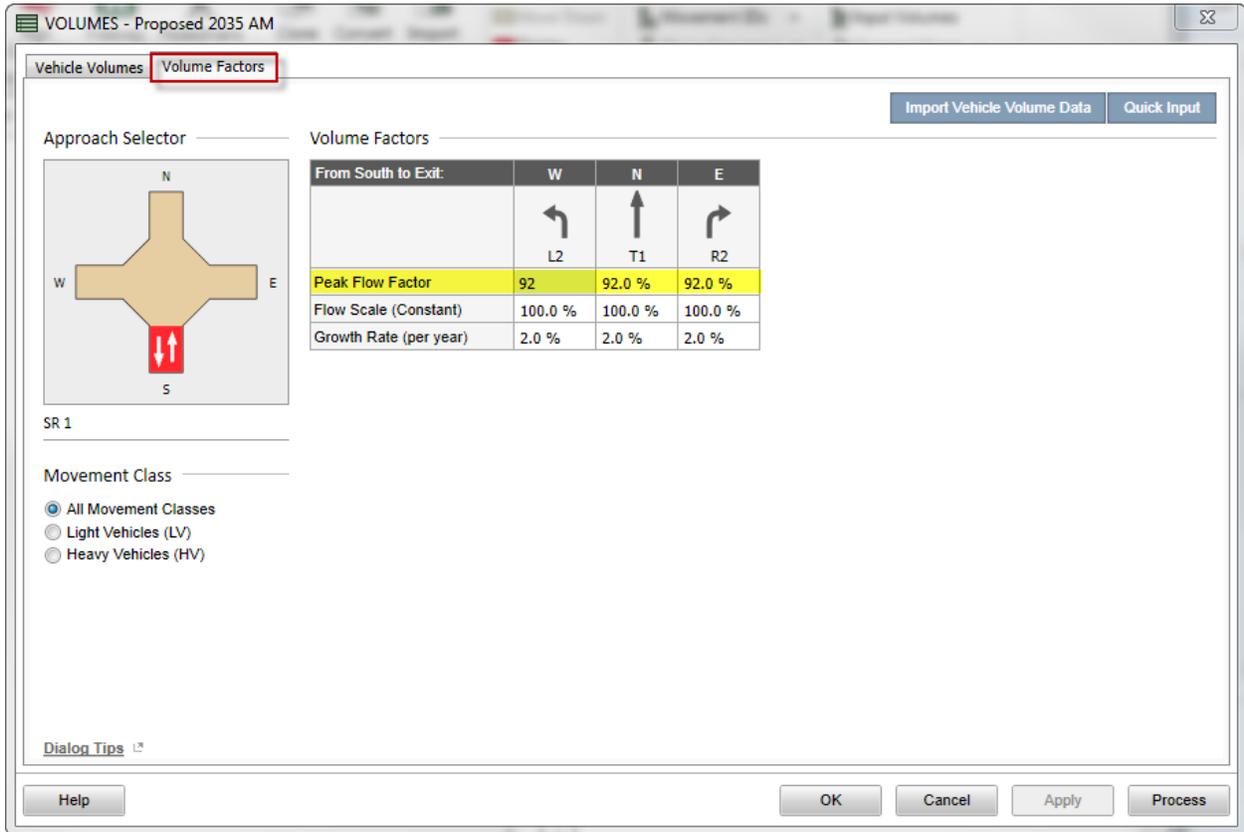


1. Select the **Vehicle Volumes** Tab
2. Select an approach leg from the **Approach Selector** diagram
3. Select **Total & %** from the **Volume Data Method** drop down list
4. Complete the **Movement Volumes for Selected Approach**
 - a. **Total (veh)**: enter the turn movement volumes (DHV)
 - b. **Heavy Vehicles (%)**: enter the percent heavy vehicles

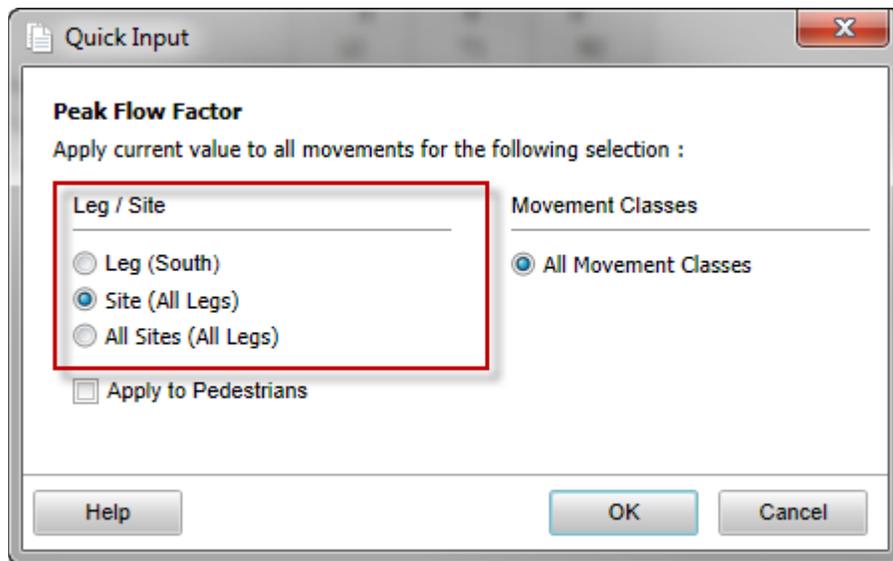
**hint: enter for the first field then click the Quick Input box (top right corner) and select Site to apply to %HV to all lanes and all legs)*



4. Select the **Volumes Factors** tab
 - a. **Peak Flow Factor**: enter the PHF (peak hour factor)



**HINT: enter the PHF in the first field and then select Quick Input (top right corner) then select Site to apply to all lanes of all legs*



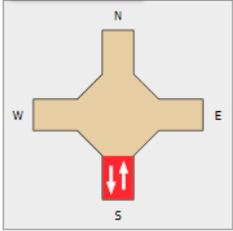
Vehicle Movement Data

VEHICLE MOVEMENT DATA - Proposed 2035 AM

Path Data Calibration

Quick Input

Approach Selector



SR 1

Movement Class

All Movement Classes
 Light Vehicles (LV)
 Heavy Vehicles (HV)

Movement Path Data

From South to Exit:	W	N	E
	 L2	 T1	 R2
Approach Cruise Speed	40	40 mph	40 mph
Exit Cruise Speed	40 mph	40 mph	40 mph
Negotiation Speed	Program ▾	Program ▾	Program ▾
Negotiation Distance	Program ▾	Program ▾	Program ▾
Downstream Distance	Program ▾	Program ▾	Program ▾
Negotiation Radius	Program ▾	Program ▾	Program ▾

Dialog Tips

Help OK Cancel Apply Process

1. Select an approach leg from the **Approach Selector** Diagram
2. Movement Path Data
 - a. **Approach Cruise Speed**: enter the approach speed
 - b. **Exit Cruise Speed**: enter the exiting speed

Model Settings

1. Go to the **Options** Tab. Select **Delay & v/c (HCM 2010)** from the drop down for **Level of Service Method**

The screenshot shows the 'MODEL SETTINGS - Proposed 2035 AM' dialog box with the 'Options' tab selected. The 'Level of Service Method' dropdown is set to 'Delay & v/c (HCM 2010)'. Other settings include 'Level of Service Target' (LOS D), 'Performance Measure' (Delay), 'Percentile Queue' (95 %), and 'Hours per Year' (480 h). There is an unchecked checkbox for 'Include Short Lanes in determining Queue Storage Ratio'.

Level of Service Method	Delay & v/c (HCM 2010)
Level of Service Target	LOS D
Performance Measure	Delay
Percentile Queue	95 %
Hours per Year	480 h

Include Short Lanes in determining Queue Storage Ratio

2. Select the **Model Parameters** tab. Check **HCM Delay Formula**

The screenshot shows the 'MODEL SETTINGS - Proposed 2035 AM' dialog box with the 'Model Parameters' tab selected. The 'HCM Delay Formula' checkbox is checked. Other settings include 'Minimum Probability of Blockage' (5.0 %), 'Exclude Geometric Delay' (checked), and 'Downstream Short Lane' parameters: 'Minimum Downstream Utilisation Ratio' (20 %), 'Minimum Downstream Distance' (100 ft), 'Distance for Full Lane Utilisation' (660 ft), and 'Calibration Parameter' (1.2).

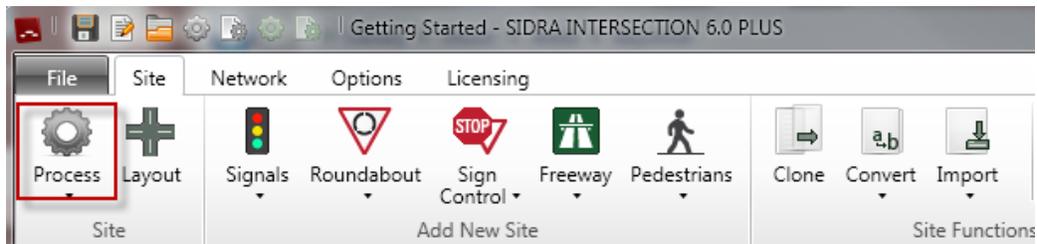
Movement Class	pcu / veh
Light Vehicles (LV)	1.0
Heavy Vehicles (HV)	2.0

Exclude Geometric Delay
 HCM Delay Formula

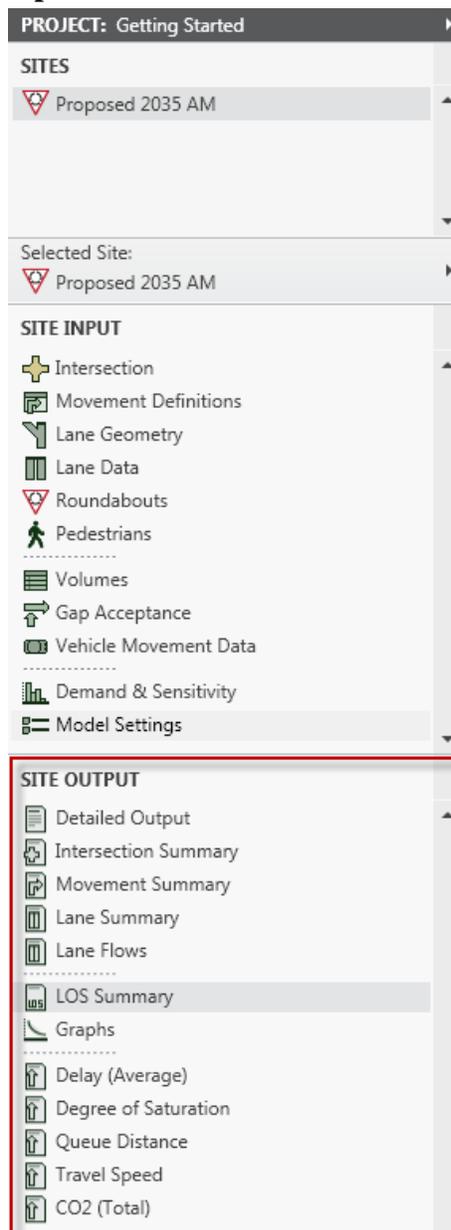
Minimum Downstream Utilisation Ratio	20 %
Minimum Downstream Distance	100 ft
Distance for Full Lane Utilisation	660 ft
Calibration Parameter	1.2

IV. PROCESS

1. Select **Process** from the **Site** tab in the menu bar.



2. Output appears under **Site Output** of the side menu



V. OUTPUT

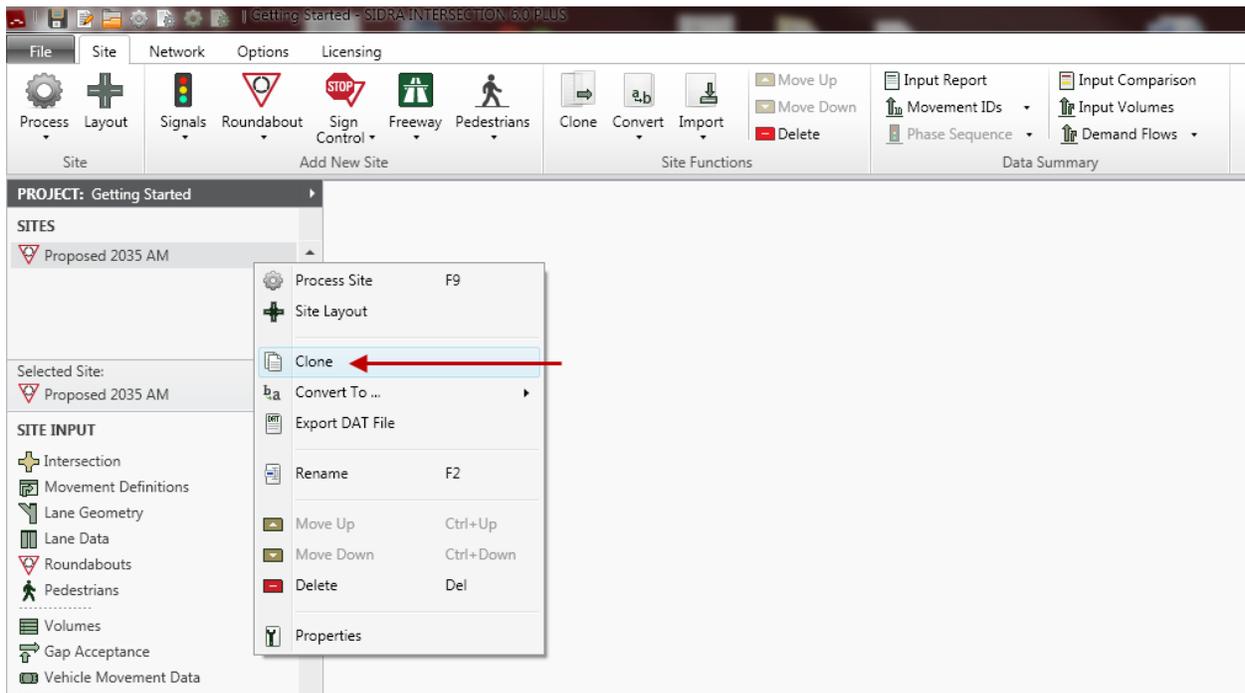
Site Output (most useful reports)

1. Intersection Summary: provides a brief overview of the entire roundabout. Shows:
 - a. Intersection LOS
 - b. Control Delay (total, average, worst lane and worst movement)
 - c. Geometric Delay (average)
 - d. 95% Back of Queue (vehicles and distance for worst lane)
2. Lane Summary: provides a breakdown for each lane and approach including
 - a. Average Delay
 - b. LOS
 - c. 95% Queue (vehicle and distance)
** denotes the dominate lane for each approach (useful for multilane roundabouts)*
3. LOS Summary:
 - a. displays the LOS for each lane geographically
 - b. LOS for the intersection
4. Delay (average) : shows
 - a. Delay for each movement.
 - b. Delay and LOS for each approach.
 - c. Delay and LOS for the intersection
5. Queue Distance: displays the longest 95% back of queue for each movements

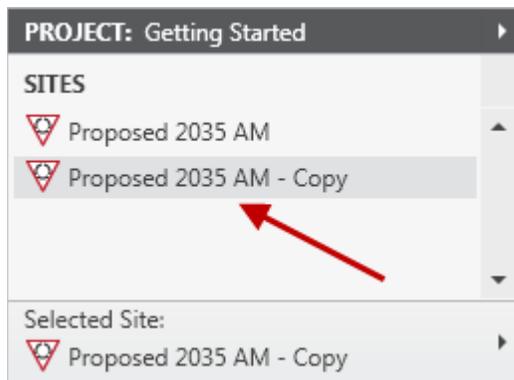
VI. Cloning a Site

So far this guide has walked through the steps to evaluate one roundabout site. However multiple sites need to be evaluated when analyzing a roundabout. At the very least both the AM and PM peaks should be evaluated along with the build year and design year DHV traffic. Additionally, the need to consider other geometric alternatives is often necessary as part of the design process. Thankfully SIDRA allows you to easily clone a current site to allow for the simple creation of alternatives.

1. Right click on the project to be copied and select **Clone**

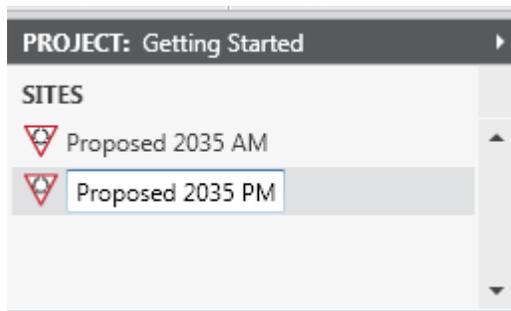


A new site is created and named a conversion of the cloned site.



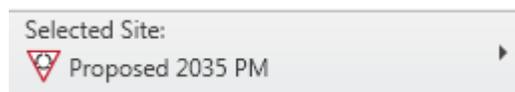
2. Rename the alternative

right click on the copy and select **rename*



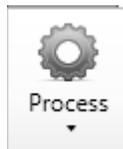
3. Change the input necessary to reflect the changes to the RAB that are to be analyzed

**be sure that the correct site is selected*



- a. INTERSECTION - Always change the **Site Name** and the **Site Title** box to reflect the alternative change (for output files)
- b. LANE GEOMETRY – be sure to make any changes to the geometry to reflect the new alternative (change the lane width, add a bypass lane, remove a lane)
- c. ROUNDABOUTS – make any changes to the circulating width or the center island diameter
- d. VOLUMES – make any changes to the traffic volume. (change from AM to PM DHV, change the Peak Hour Factor, change the percent heavy vehicles)

4. Process the result again (make sure you have the new site selected)



5. Prepare the reports and evaluate the results

6. Repeat this process for as many scenarios (am vs. pm, current vs design, Alternate 1 vs Alternate 2) as you have.