



Swift Signals

User Manual

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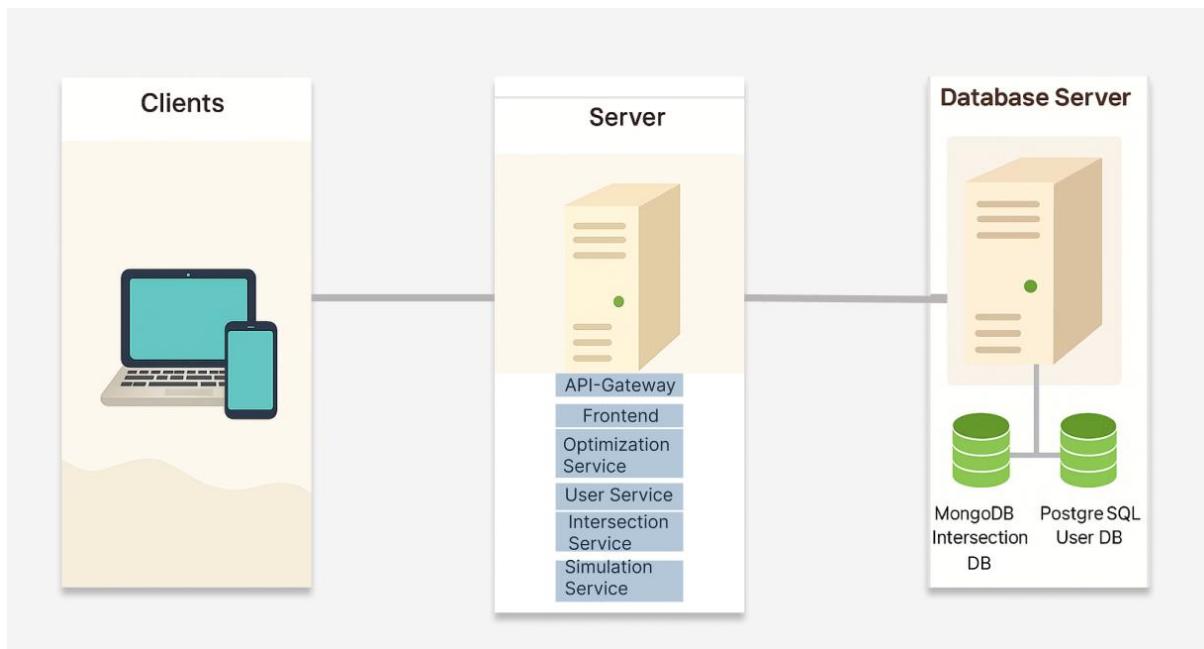
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Introduction

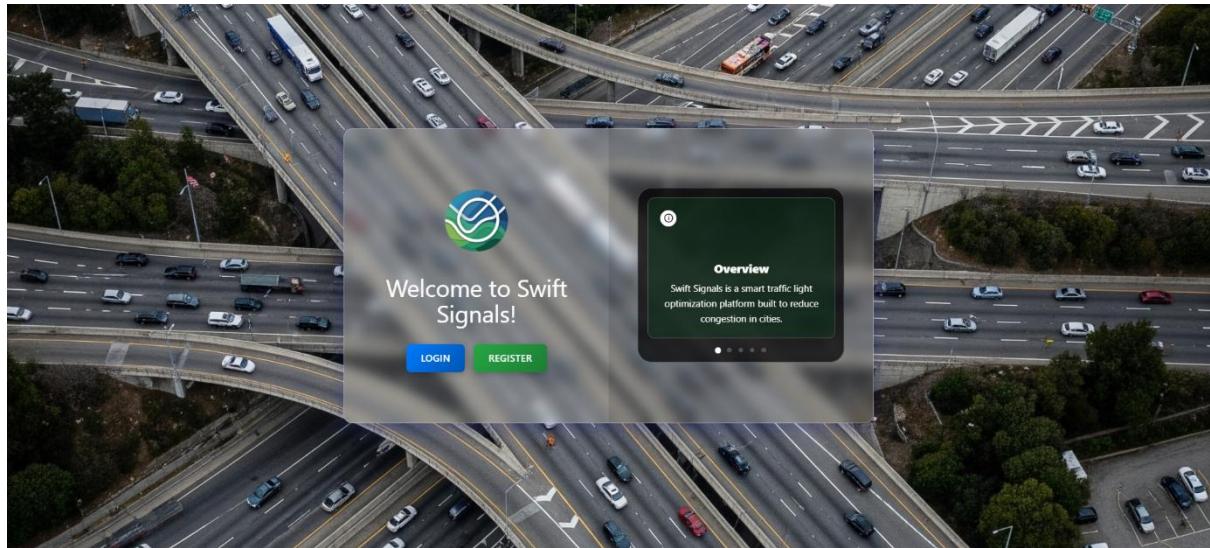
Welcome to Swift Signals! A smart traffic light system that helps cities reduce traffic jams. It uses simulations and machine learning to improve how traffic lights work. It helps you test different traffic setups using real-world intersections and find the best light patterns to keep vehicles moving smoothly.

This guide will help you navigate through the application. The Welcome Page will be the landing page, where you can view an overview of the application. You will have the option to either go to the login or signup page depending on whether you have an account or not. Once you have logged in, you will be able to access the Dashboard, Intersections, Simulations and Users pages. You may switch between dark and light mode using the button at the bottom of your screen. You can also sign out once you are done with the application. All of this can be located on the navbar.

Deployment Model



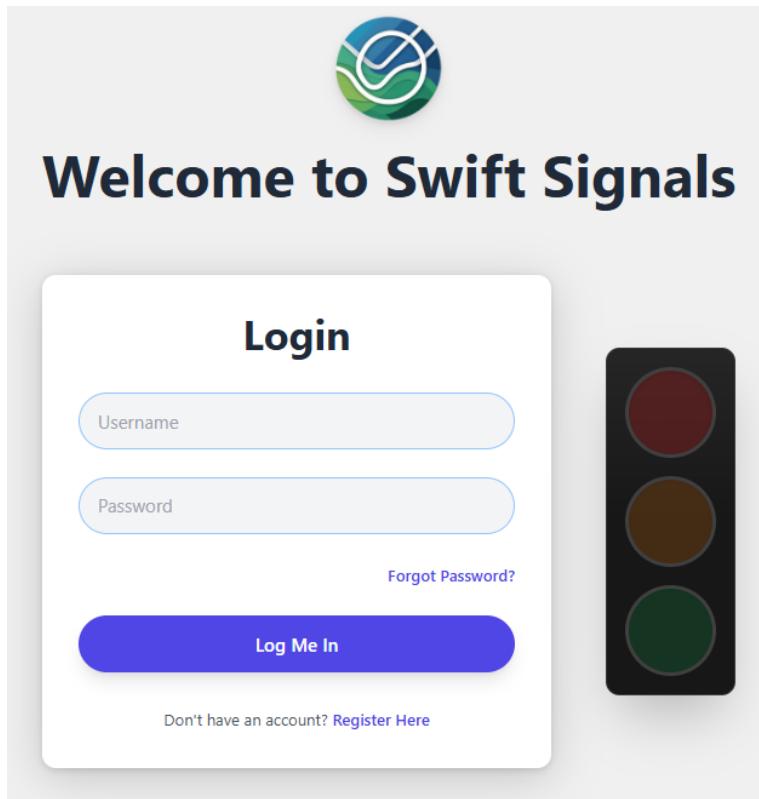
Welcome Page



The Welcome Page provides you with information about the system and gives you an idea of what the application is all about. You can swipe the component on the right-hand side of the form for more information about the application. The page includes two buttons which can redirect you to either the login or the signup pages.

If you already have an account, click on the Login button. You will be redirected to the login page. If not, click on the Register button. You will be redirected to the Signup page.

Sign In



If you already have an account, follow these steps to access your dashboard:

Steps:

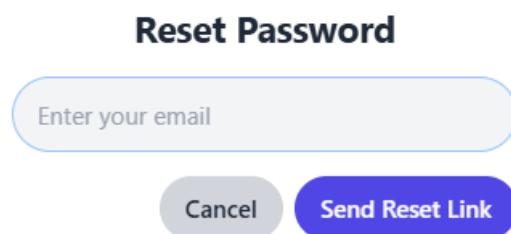
1. Enter your Email – Use the email address you registered with.
2. Enter your Password – Type in your account password.
3. Click the “Log Me In” Button – You’ll be redirected to your user dashboard.

Tip: If you don't have an account yet, click the “Register Here” link above the Log Me In button to create one.

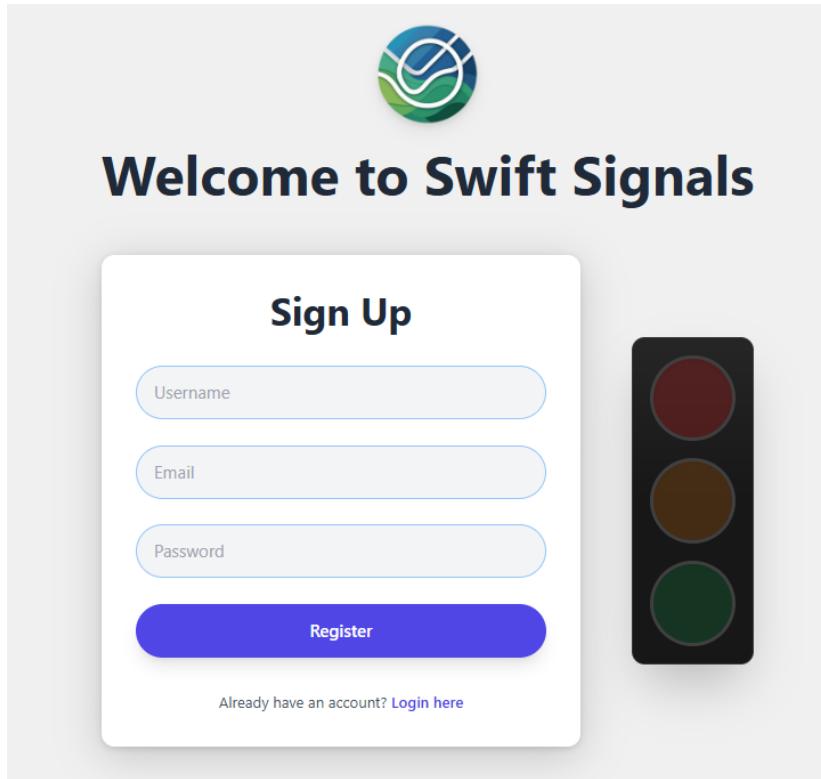
If you forgot your password, follow these steps:

Steps:

1. Click the “Forgot Password?” Button – You’ll will then have the option to enter a password.
2. Enter your password – Enter an existing password
3. Reset Password – Enter your new password



Sign Up



If you're new, create an account:

Steps:

1. Username – Choose a unique username.
2. Email – Enter a valid email address.
3. Password – Create a strong password.
4. Confirm Password – Re-enter your password for confirmation.
5. Click the “Register” Button – Your account will be created, and you’ll be directed to sign in.

Note: Passwords must match. If there's an error, you'll be prompted to correct it before proceeding. After the account has been created correctly, a pop-up message will appear indicating that the account has been created successfully. You will be required to insert your email and new password on the sign-in page.

Navbar



Once you have reached the dashboard, you will see the navbar on top of your screen. It includes the logo on the left as well as various texts that lead to other pages once clicked on. The pages include the Dashboard, Intersections, Simulations and Users pages. It also includes sign-out button which can be used to sign-out once you are done using the application. It is included in all the pages after login.

Dashboard

The dashboard provides a comprehensive view of your overall statistics and options to perform various tasks such as add new intersection, run simulation and viewing the map. Once you have logged in, this is the first screen you will see. It acts as the main hub for all your traffic management activities.

The dashboard features several key components:

- Total Intersections:** Displays 2 intersections. Includes a "New Intersection" button, a "Run Simulation" button, and a "View Map" button.
- Active Simulations:** Displays 0 active simulations. Includes a play icon.
- Optimization Runs:** Displays 156 optimization runs. Includes a chart icon.
- Recent Simulations:** A table showing two recent simulations:

| # | Intersection | Status | Actions |
|---|--|-------------|------------------------------|
| 1 | Corner of Albertus Street & Simon Vermoeten Road | unoptimised | View Details |
| 2 | Corner of Lynnwood & Jan Shoba | unoptimised | View Details |
- Traffic Density Distribution:** A line chart showing traffic density from High to Low across two intersections.
- Recent Intersections:** A table showing two recent intersections:

| Intersection | Status | Date |
|----------------------------|-------------|--------|
| Albertus & Simon Vermoeten | Unoptimised | Aug 17 |
| Lynnwood & Jan Shoba | Unoptimised | Aug 17 |

Dashboard Overview

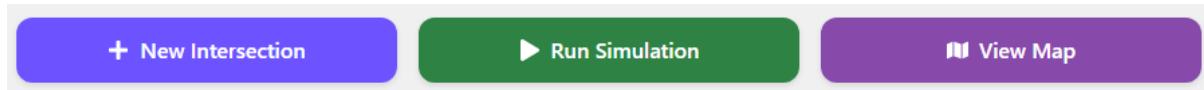
At the top of the screen, you will find an overview of your system's key metrics, displayed in a series of cards. The layout of these cards has been updated to place the icon on the right.

- Total Intersections:** Displays the total number of intersections currently in the system.
- Active Simulations:** Shows the number of simulations that are currently running.
- Optimization Runs:** Indicates the total number of optimization processes that have been executed.

Quick Actions

Below the overview, you have access to primary actions. These buttons are now arranged in a responsive grid that adjusts to your screen size for improved usability.

- **+ New Intersection:** Click this button to begin the process of adding a new intersection to the system.
- **Run Simulation:** This button allows you to launch a new traffic simulation.
- **View Map:** Use this button to open a map view of all your configured intersections.



Recent Simulations

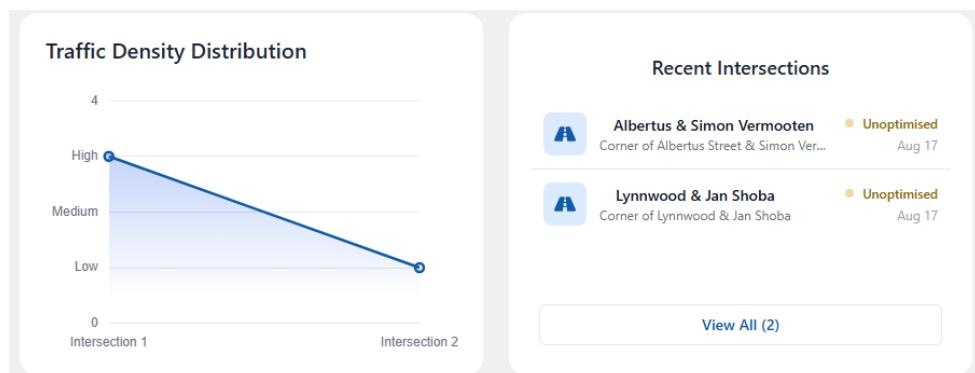
This section contains a table that lists your most recent simulation activities, allowing you to track their progress at a glance.

- **#:** The number of the simulation.
- **Intersection:** The name of the intersection where the simulation was run.
- **Status:** The current status of the simulation is shown in a coloured tag (e.g., optimised, unoptimised) to make it easily identifiable.
- **Actions:** Click the "View Details" link to see more information about a specific simulation.

Traffic Distribution & Recent Intersections

The column on the right side of the dashboard is dedicated to more detailed analytics.

- **Traffic Density Distribution:** This card features an updated line graph that visualizes traffic density patterns. The graph now uses a blue colour scheme. You can hover your mouse over the graph to view specific data points.
- **Recent Intersections:** This card shows a ranked list of your recently created intersections. Each entry displays the intersection's name, its address, status, and creation date. The card also displays the **View All** button at the bottom.



Help Menu

A new Help Menu has been added to the application. This feature gives you direct access to documentation, support, and other helpful resources from within the dashboard, ensuring that assistance is always just a click away. This is located in a tab on the right-hand side of the screen.



Intersections

The Intersections page is where you can view, manage, and organize all the intersections within the Swift Signals system. You can access this page from the main navigation bar.

The screenshot shows the 'Intersections' page of the Swift Signals application. At the top, there is a navigation bar with the logo 'Swift Signals', 'Dashboard', 'Intersections' (which is highlighted in blue), 'Simulations', 'Users', and a user profile 'Default Admin'. Below the navigation bar is a search bar with the placeholder 'Search by Name...' and an 'Add Intersection' button. The main content area displays two intersection entries in cards:

- Lynnwood & Jan Shoba**
ID: f3b83d9d-e5d6-4e49-a13c-b30f2bc09c55
Location: Corner of Lynnwood & Jan Shoba
Type: Traffic Light
- Albertus & Simon Vermooten**
ID: 8fb4e639-175f-4e3f-92d6-1c8f3e0d577a
Location: Corner of Albertus Street & Simon Vermooten Road
Type: Traffic Light

Each card has three action buttons on the right: 'Simulate' (blue), 'Edit' (green), and 'Delete' (red). A vertical 'HELP' button is visible on the far right edge of the page.

Page Controls

At the top of the page, you will find controls that allow you to search for specific intersections and add new ones.

- Search Bar:** A search bar is located on the left to help you quickly find a specific intersection. You can filter the list by entering an intersection's **Name**.
- Add Intersection Button:** On the right, the "**Add Intersection**" button allows you to create and configure a new intersection entry in the system.

This image shows a close-up of the top navigation bar of the 'Intersections' page. It features a search bar with the placeholder 'Search by Name...' and an 'Add Intersection' button. The rest of the page content is blurred out.

Create Intersection Modal

The user is greeted with a modal upon clicking the “Add Intersection” button, which allows them to enter the following information:

General Information:

- **Intersection Name:** Enter a descriptive name (e.g., "Lynnwood & Atterbury")
- **Traffic Density:** Select Low, Medium, or High based on expected traffic volume

Location Details:

- **Address/Cross Streets:** Enter the intersection location
- **City:** Specify the city (defaults to Pretoria)
- **Province:** Specify the province (defaults to Gauteng)

Simulation Parameters:

- **Intersection Type:** Currently supports Traffic Light intersections
- **Green Light Duration:** Time in seconds for green light phase
- **Yellow Light Duration:** Time in seconds for yellow light phase
- **Red Light Duration:** Time in seconds for red light phase
- **Vehicle Speed:** Maximum speed in km/h for vehicles

Create New Intersection

General Information

Intersection Name
e.g., Lynnwood & Atterbury

Traffic Density
Low Medium High

Simulation Parameters

Intersection Type
Traffic Light

| | | |
|-----------------|-----------------|---------------|
| Green (s) 30 | Yellow (s) 3 | Red (s) 27 |
|-----------------|-----------------|---------------|

Vehicle Speed (km/h)
60

Location Details

Address / Cross Streets
Corner of Lynnwood Rd and Atterbury Rd

City
Pretoria

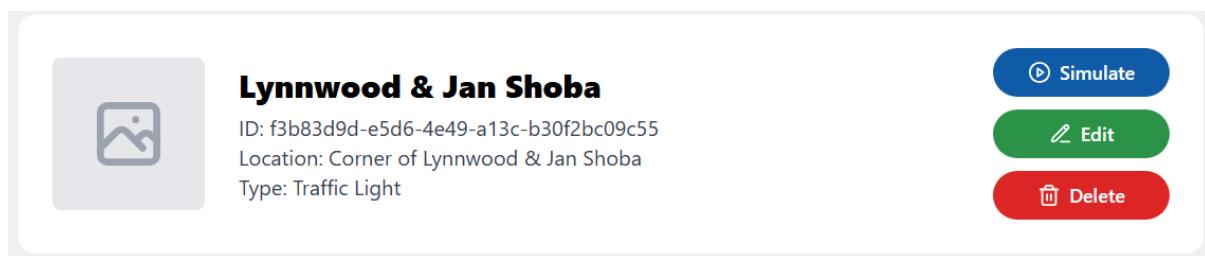
Province
Gauteng

Cancel Create Intersection

Intersection Card

Each intersection in the system is displayed on its own dedicated card. The list of cards is scrollable. Each card provides detailed information and management options.

- **Intersection Image:** On the left of the card, a space is reserved for a thumbnail image of the intersection. If no image is available, a placeholder icon is shown.
- **Intersection Details:** The central part of the card displays key information:
 - **Name:** The unique name of the intersection (e.g., "Main St & 1st Ave").
 - **ID:** The system-assigned ID number.
 - **Location:** The geographical area or suburb (e.g., "Pretoria CBD").
 - **Lanes:** A description of the lane configuration (e.g., "4-way, 2 lanes each").
- **Action Buttons:** On the right side of the card, a set of buttons allows you to perform actions for that specific intersection:
 -  **Simulate:** Launches a new traffic simulation for the intersection.
 -  **Edit:** Opens the editor to modify the intersection's details.
 -  **Delete:** Removes the intersection from the system.



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Simulations

The Simulations page provides a comprehensive dashboard for creating, viewing, and managing all traffic simulations and optimizations. The page is organized into two main sections for clarity and ease of use.

The screenshot shows the Swift Signals web application interface. At the top, there's a navigation bar with the logo 'Swift Signals' and links for 'Dashboard', 'Intersections', 'Simulations' (which is underlined in blue), and 'Users'. On the right side of the header is a user profile icon for 'Default Admin' and a help icon. The main content area is divided into two columns: 'Recent Simulations' on the left and 'Recent Optimizations' on the right. The 'Recent Simulations' section has a table with two rows:

| NO. | INTERSECTION | TRAFFIC DENSITY | SPEED | STATUS | ACTIONS |
|-----|---|-----------------|----------|-------------|---------|
| #1 | Corner of Albertus Street & Simon Verwoerd Road | Low | 180 km/h | unoptimised | |
| #2 | Corner of Lynnwood & Jan Smuts | High | 60 km/h | unoptimised | |

The 'Recent Optimizations' section shows a message: 'No Data to Display' with a note: 'There are no simulations available at the moment. Create a new simulation to get started.' At the bottom of the page, there's a footer with the text 'A Southern Cross Solutions Product' and '© 2015 Swift Signals. All rights reserved.'

Page Layout

The main screen is divided into a two-column grid:

- **Recent Simulations:** The left column is dedicated to standard traffic simulations. From here, you can view past simulations and create new ones.
- **Recent Optimizations:** The right column displays a history of your optimization runs, which are specialized simulations aimed at improving traffic flow.

Simulations & Optimizations Tables

Both columns contain a powerful table for displaying data. While their data is different, their functionality is identical.

Table Controls

Above each table, you will find a title and a dropdown menu that allows you to filter the list by a specific intersection.

Table Contents

Each row in the table represents a single simulation or optimization run and includes the following columns:

- **Simulation #:** The number of the simulation.
- **Intersection:** The name of the intersection involved.
- **Traffic Density:** The traffic density of the intersection.
- **Speed:** The average speed of the vehicles in the simulation.

- **Status:** A coloured tag indicates the current state (e.g., optimised, unoptimised).
- **Actions:** Icon buttons to manage the entry:
 -  **View:** Opens the detailed results page for the simulation.
 -  **Delete:** Permanently removes the simulation entry.

Pagination

If there are more entries than can fit on one page, navigation controls will appear at the bottom of the table, including "Prev" and "Next" buttons, along with page numbers.

| SIMULATION ID | INTERSECTION | AVG WAIT TIME | THROUGHPUT | GRAPH | STATUS | ACTIONS |
|---------------|-------------------|---------------|------------|--|----------|---|
| SIM001 | Main St & 1st Ave | 45.2 | 1200 |  | Complete |   |
| SIM002 | Broadway & 5th St | 30.8 | 1500 |  | Running |   |
| SIM003 | Elm St & Park Rd | 52.1 | 900 |  | Failed |   |
| SIM004 | Main St & 1st Ave | 45.2 | 1200 |  | Complete |   |

Prev 1 2 Next

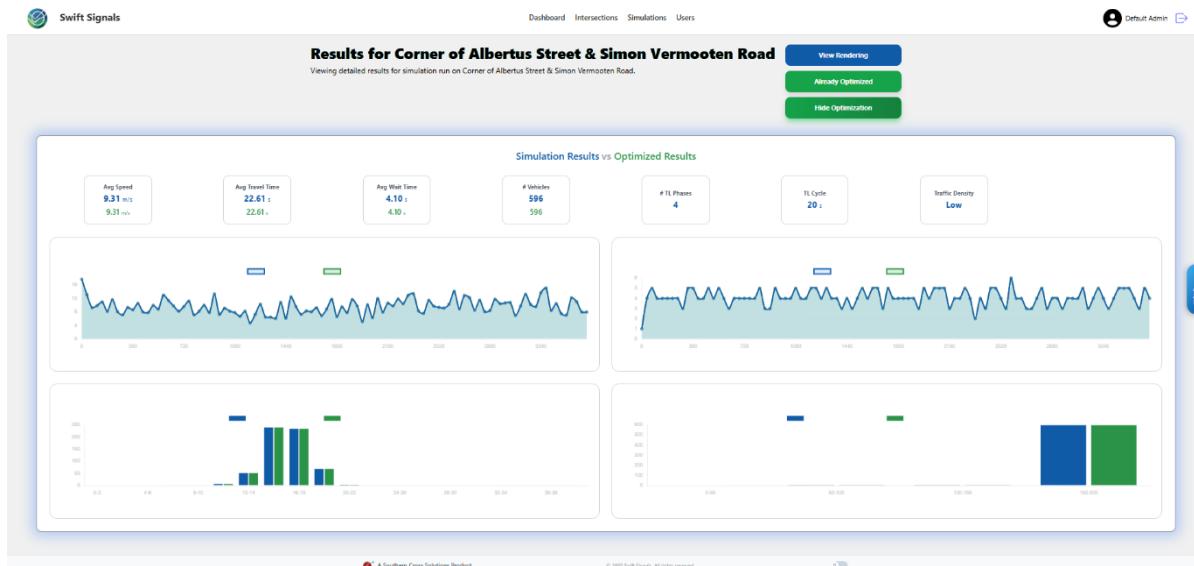
Help Menu

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Simulation Results

After creating and running a simulation from the Simulations page, you will be directed to the Simulation Results page. This page provides a detailed, interactive environment to analyse and compare the initial simulation with an optimized version.



Simulation Details

At the top of the page, you will find the core details of the simulation you are viewing:

- **Simulation Name:** The title of the simulation run.
- **Description:** The description you entered when creating the simulation.
- **View Rendering Button:** A button that takes the user to the rendering of the simulation.
- **Optimize Button:** A Button that optimizes the simulation.

Interactive Visualizations

The main content area is split into two distinct sections, allowing for direct comparison between your initial setup and a potential, improved version.

Statistic Cubes and Graphs are displayed, with both the Simulation and Optimisation data displayed together. The following are displayed:

Statistic Cubes:

- Average Speed.
- Average Travel Time
- Average Wait Time
- Number of Vehicles
- Number of Traffic Light Phases
- Traffic Light Cycle Time
- Traffic Density

Graphs:

- Average Speed Over Time (Line Graph)
- Vehicle Count over Time (Line Graph)
- Final Speeds (Histogram)
- Total Distance (Histogram)

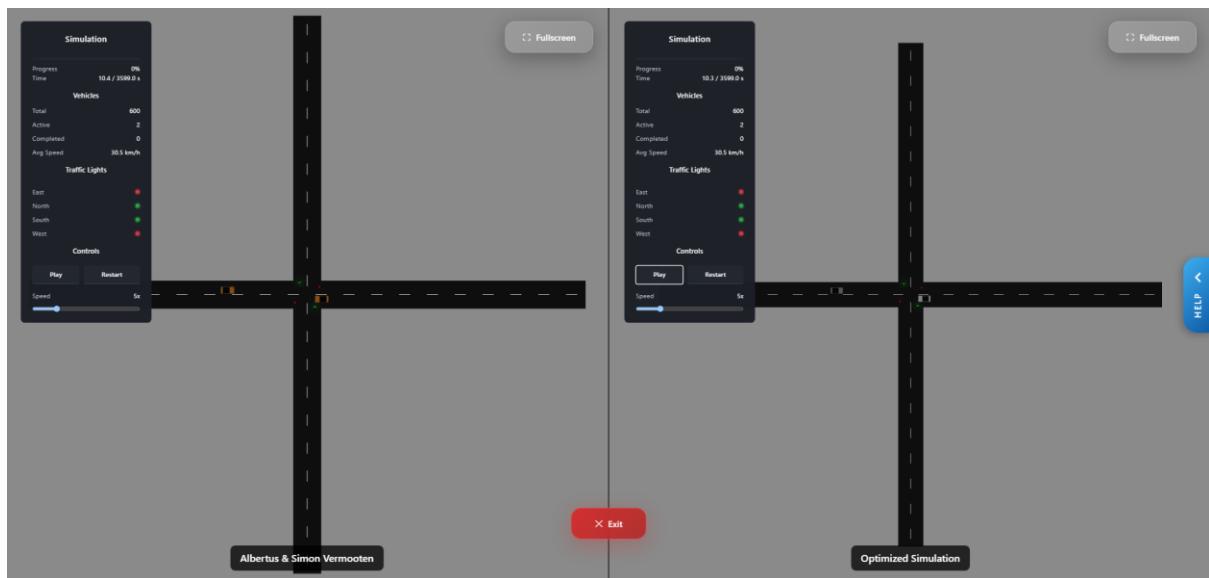
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Simulation Rendering Page

This page displays a side-by-side rendering of the Simulation and Optimised Simulation.



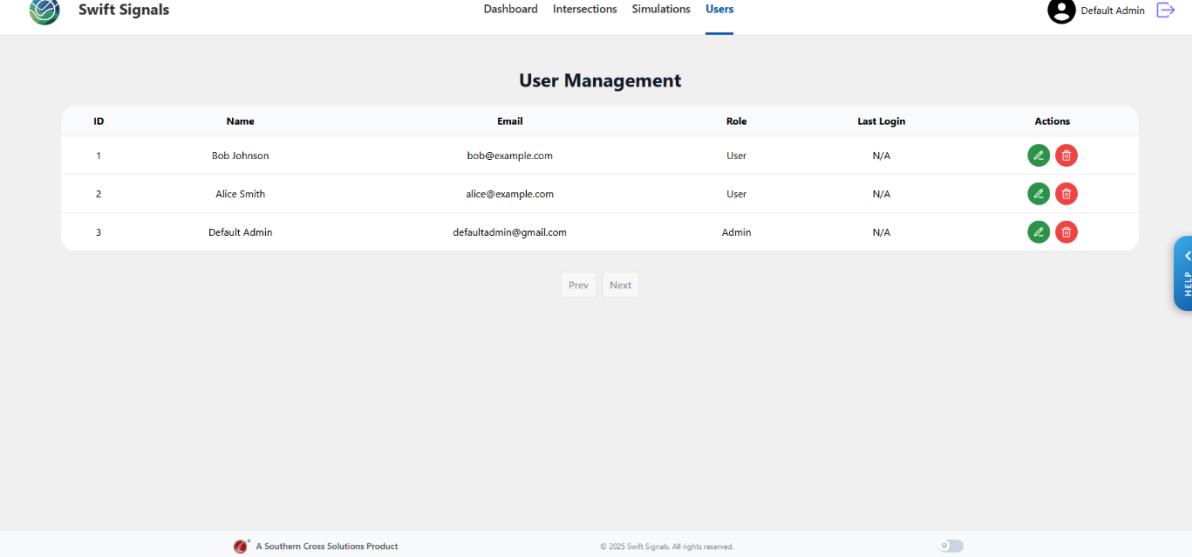
On the left is the Original Simulation Rendering.

On the right is the Optimised Simulation Rendering.

Both Sides have a UI Panel displaying key statistics, pause/play button, restart button, and speed controls.

Users Page

The Users page provides administrators with a comprehensive list of all users in the system. From this central location, you can view user details and perform essential management tasks.



The screenshot shows the 'User Management' section of the Swift Signals application. At the top, there are navigation links: Dashboard, Intersections, Simulations, and a highlighted 'Users' tab. On the right, there's a user profile for 'Default Admin' and a help icon. The main area displays a table titled 'User Management' with the following data:

| ID | Name | Email | Role | Last Login | Actions |
|----|---------------|------------------------|-------|------------|---------|
| 1 | Bob Johnson | bob@example.com | User | N/A | |
| 2 | Alice Smith | alice@example.com | User | N/A | |
| 3 | Default Admin | defaultadmin@gmail.com | Admin | N/A | |

Below the table are 'Prev' and 'Next' navigation buttons. At the bottom, there's a footer with the text 'A Southern Cross Solutions Product' and '© 2025 Swift Signals. All rights reserved.'

Users Table

The main feature of this page is the users table, which is designed to present user information in a clear and organized manner. The number of users displayed on each page may adjust automatically based on your screen size to ensure optimal viewing.

Table Columns

The table is organized into the following columns:

- ID:** The unique identification number assigned to each user.
- Name:** The full name of the user.
- Email:** The user's registered email address.
- Role:** The permission level assigned to the user (e.g., Admin, Engineer, Viewer).
- Last Login:** The date and time of the user's last login session.
- Actions:** A dedicated column for user management controls.

User Actions

The Actions column contains two icon buttons for each user:

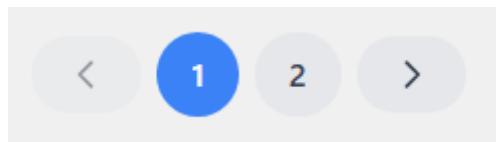
- Edit (Pencil Icon):** Click the green button with the pencil icon to modify a user's details and role permissions.
- Delete (Trash Icon):** Click the red button with the trash icon to permanently remove a user from the system.

| ID | Name | Email | Role | Last Login | Actions |
|----|---------------|------------------------|-------|------------|---|
| 1 | Bob Johnson | bob@example.com | User | N/A |   |
| 2 | Alice Smith | alice@example.com | User | N/A |   |
| 3 | Default Admin | defaultadmin@gmail.com | Admin | N/A |   |

Pagination Controls

Located below the table, the pagination controls allow you to navigate through the list of users if there are too many to display on a single page.

- Previous & Next Buttons:** Use the arrow buttons on the far left and right to move to the previous or next page.
- Page Numbers:** Click on a specific number to jump directly to that page. The current page will be highlighted with a blue background.
- Ellipsis (...):** If there is a large number of pages, an ellipsis (...) will be displayed to indicate a gap in the page number sequence for a more compact view.



Help Menu

A new Help Menu has been added to the application. This feature gives you direct access to documentation, support, and other helpful resources from within the dashboard, ensuring that assistance is always just a click away. This is located in a tab on the right-hand side of the screen.



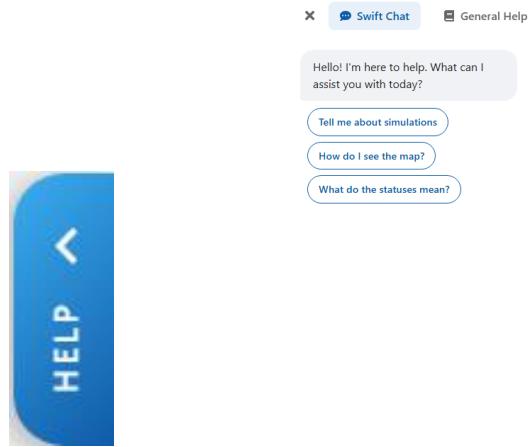
Help Menu & Support

The Swift Signals platform includes an integrated, comprehensive Help Menu designed to provide on-demand assistance without interrupting your workflow. It offers support through an AI-powered chatbot, interactive tutorials, and a detailed FAQ section.

Accessing the Help Menu

You can access the support panel from any page within the application.

- **Activation:** On the right-hand edge of your screen, you will find a floating "**HELP**" button. Click this button to slide the Help Menu open.
- **Closing:** To close the menu, you can either click the "**HELP**" button again or click the "X" icon inside the menu panel.

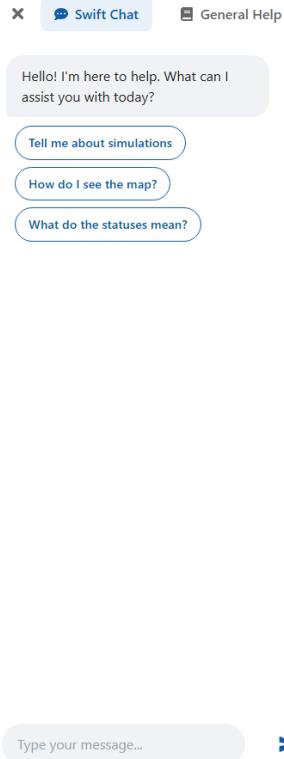


The Help Menu is organized into two main tabs: **Swift Chat** and **General Help**.

Swift Chat (AI Chatbot)

The default tab is Swift Chat, an AI-powered chatbot designed to answer your questions in real-time.

- **Asking Questions:** Type your question into the message box at the bottom and either press **Enter** or click the **Send** icon.
- **Quick Replies:** For common queries, the chatbot may provide "quick reply" buttons below its answer. Clicking one of these buttons will send a pre-defined follow-up question, making it faster to get the information you need.
- **Starting Tutorials:** You can ask the chatbot to guide you. For example, typing "*Show me how the dashboard works*" will prompt the chatbot to start the interactive tutorial for the Dashboard page.



General Help

The General Help tab contains a library of self-serve resources, including interactive tutorials and a list of frequently asked questions.

Interactive Tutorials

This section provides step-by-step guided tours of the application's main features.

- **Launching a Tutorial:** Under the "Tutorials" dropdown, click on the topic you want to learn about (e.g., Dashboard Tutorial, Intersections Tutorial). This will launch an interactive, on-screen guide.
- **Guided Steps:** The tutorial will darken the screen and highlight a specific feature, displaying a pop-up box with a description and navigation controls like "**Previous**" and "**Next**".
- **Navigation Confirmation:** If you launch a tutorial for a page you are not currently on, a confirmation window will appear asking for your permission to navigate to the correct page first.

Tutorials

Navigation Tutorial

Learn how to use the site's navbar and footer.

Dashboard Tutorial

An interactive walkthrough of the main dashboard.

Intersections Tutorial

Learn how to search, add, and manage intersections.

Simulations Tutorial

Learn how to run simulations and optimizations.

Users Tutorial

Learn how to run, edit, and delete users.

Simulation Results Tutorial

Learn how to analyze simulation data, charts, and statistics.

3D Comparison View Tutorial

Learn how to compare original vs optimized simulations in 3D.

Frequently Asked Questions

The screenshot shows the Swift Signals dashboard interface. At the top, there are three summary cards: 'Total Intersections' (4), 'Active Simulations' (0), and 'Optimization Runs' (156). Below these are sections for 'Recent Simulations' (listing four entries: 322 Albertus Street, Corner Garsfontein & January Masilela, Corner of Albertus Street & Simon Vermooten Road, and Corner of Lynnwood & Jan Shoba, all marked as 'unoptimised') and 'Recent Intersections' (listing four entries: Joshua Garner at 322 Albertus Street, Garsfontein & January Masilela, Albertus & Simon Vermooten, and Lynnwood & Jan Shoba, all marked as 'Unoptimised'). A central feature is a 'Summary Cards' modal window displaying a line graph titled 'Distribution' showing a bell curve with 'Medium' at the peak and 'Low' at the bottom. The graph has four data points corresponding to the intersections listed in the 'Recent Simulations' section. The bottom of the screen includes a footer with the text 'A Southern Cross Solutions Product' and '© 2025 Swift Signals. All rights reserved.'

Frequently Asked Questions (FAQ)

This section contains a detailed list of common questions about the Swift Signals platform, its purpose, and its technology.

- **How to Use:** The FAQ section is an accordion menu.

1. First, click the main "Frequently Asked Questions" header to reveal the list of questions.

2. Then, click on any individual question to expand it and view the detailed answer.

X Swift Chat General Help

Frequently Asked Questions ^

- What is Swift Signals? ▾
- Who is Swift Signals designed for? ▾
- What problems will Swift Signals solve? ▾
- How does the platform work? ▾
- What technologies power Swift Signals? ▾
- Can Swift Signals be used for multiple intersections? ▾
- How is the system deployed? ▾
- Does it support real-time traffic? ▾
- How are intersections configured in the system? ▾
- What kind of reports or analytics does the system generate? ▾
- Is this product finished or in development? ▾
- How can I start using Swift Signals? ▾