notraffic

Intersection Manager Installation Assistant Version 4+

User Guide

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NoTraffic Intersection Manager User Guide Version 4+ 07/08/2025

Regulatory Compliance and Installation Requirements

Product installation and qualification must be carried out in accordance with NoTraffic's instructions and in full compliance with all applicable local traffic laws, safety codes, and regulatory requirements.

Table of Contents

1. General

1.1 Scope

This guide describes how to connect to the Installation Assistant, part of Intersection Manager Version 4+, to set up and configure the Nexus and Sensors in an intersection.

Terminology

Term/Abbreviation	Description
Approach	Traffic direction. Also know as a leg.
Apps	Applications
BIU	Bus Interface Unit
CV	Connected Vehicle
DHCP	Dynamic Host Configuration Protocol
FYA	Flashing Yellow Arrow
IM	Intersection Manager – Web-based user interface to configure the intersection
ITS	Intelligent Transport Systems
Mobility OS	Mobility Operating System
NEMA	National Electrical Manufacturers Association
NOC	NoTraffic Operations Center
NTCIP	National Transportation Communications for Intelligent Transportation System Protocol
RSU	Road Side Unit
SDLC	Synchronous Data Link Control
SIU	Serial Interface Unit
TLS	Traffic Light Status
TSC	Traffic Signal Controller

2. System Overview

NoTraffic AI Mobility Platform uses fused sensors and machine learning algorithms to detect, identify, classify, and track discrete road users at signalized intersections. Functioning as a traditional detection system, the NoTraffic Mobility Platform actuates detector inputs of traffic signal controllers for stop bar and advance detection. As a comprehensive traffic control platform, it also provides applications (Apps) that support safety metrics, performance metrics, connected intersection (CI), V2X, and other ITS functions. The NoTraffic Mobility Platform provides both local (field) and central (cloud) software user interfaces for managing, monitoring, controlling, and reporting, with 24/7/365 support and monitoring.

The NoTraffic Mobility Platform is composed of the following major hardware components:

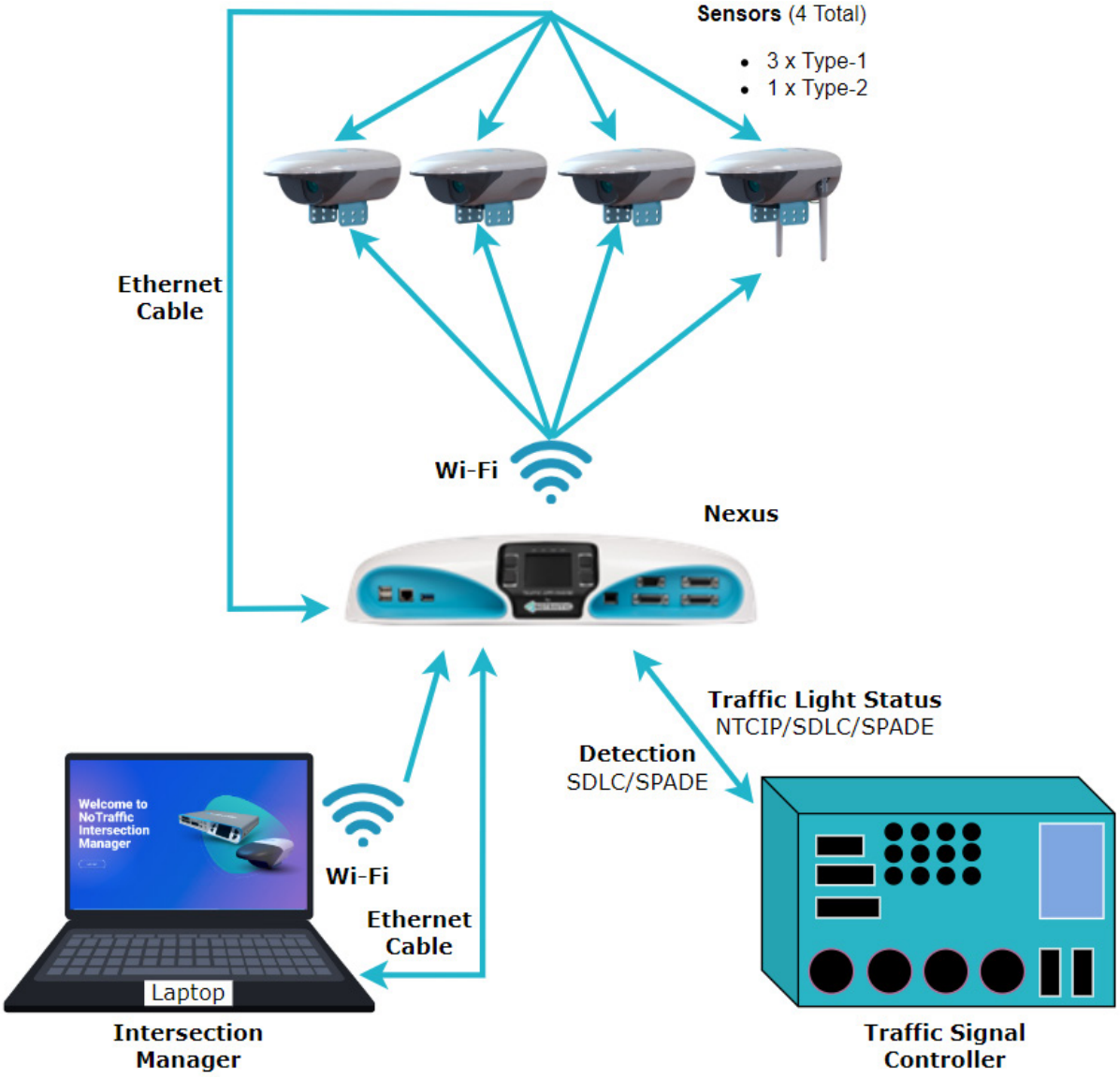
- Type-1 Sensor - The Sensor fuses video and radar to deliver precise, real-time detection and classification of road users in a broad range of weather and lighting conditions. A typical intersection uses one Sensor per approach including: one Type-2 Sensor with a built-in C-V2X RSU for direct V2X applications, and multiple Type-1 Sensors for the remainder of approaches.
- Type-2 Sensor - Agencies typically use one Type-2 Sensor per intersection. Features all the capabilities of a Type-1 Sensor and contains a built-in C-V2X RSU for direct V2X applications.
- Nexus - Installed in the cabinet and receives detection data from the Sensors and places calls to the traffic controller. The Nexus connects to the cloud-based Mobility OS and runs applications like Optimization Mode for improved traffic safety and performance.
- Main DIN Rail - The Main NoTraffic DIN rail in the cabinet that houses the communications and power supply equipment.
- Power DIN Assembly - An additional DIN Rail is required when Sensors are powered from the cabinet. It contains circuit breakers, surge suppressors, and relays to allow power cycling.
- Antenna - The Antenna ensures a reliable signal for LTE, Wi-Fi, and GPS.

The Sensors are compatible with standard camera mounting hardware using a 4" yoke-style configuration and existing infrastructure. They communicate with the Nexus mounted inside the cabinet via Wi-Fi (up to 250 feet) or Ethernet. Additional Wi-Fi repeaters extend the range for distances exceeding 250ft. Sensors can use any 120–240 V power source, including luminaires via a NEMA Tap, eliminating the need for pulling cables to the cabinet. The Sensors combines vision and radar for object detection and classification. A Type-2 Sensor with built-in capabilities for Connected Vehicle (CV) applications is installed at each intersection.

The Nexus is installed in the traffic signal equipment cabinet and connects to the TSC through a Smart Harness to SDLC (BIU, or SIU in a future release), or I/O (spades), and NTCIP (where applicable). The Nexus includes an embedded Intersection Manager (IM) application equipped with a user interface that allows viewing and editing of all real-time and configuration data of the

Nexus and Sensors. This browser interface is accessible by a user at the traffic signal equipment cabinet via a wired or wireless connection.

A schematic diagram of a typical NoTraffic system appears in the following figure.



3. Connecting a Laptop to the Nexus

To configure the intersection using the IM application embedded on the Nexus, connect a laptop to the Nexus. You can connect to the Nexus through the following methods:

- Ethernet
- Wi-Fi

Once connected, access the IM application to perform setup and configuration tasks.

3.1 Connecting with Ethernet

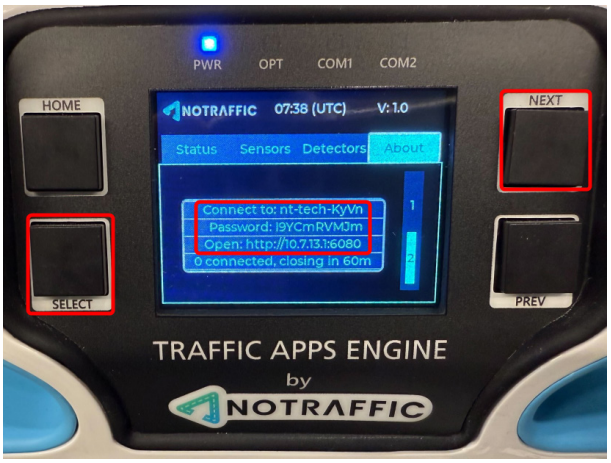
1. Connect an Ethernet cable from your laptop to the RJ45 technician port on port 5 of the external switch's rear panel..

3.2 Connecting with Wi-Fi

Use the Nexus screen and control buttons to obtain Wi-Fi connection credentials for connecting to the embedded IM app as follows:

Note
Only one user must connect at a time.

1. Press the **NEXT** button to move the menu selection to **About.**
2. Press the **SELECT** button twice to move to option **2.**
3. Press the **NEXT** button to enable Wi-Fi access.



The screen displays the Wi-Fi name, password and URL required for connecting.

4. Open Wi-Fi settings on your laptop.
5. Select the Wi-Fi network displayed by the Nexus.
6. Enter the password displayed by the Nexus.

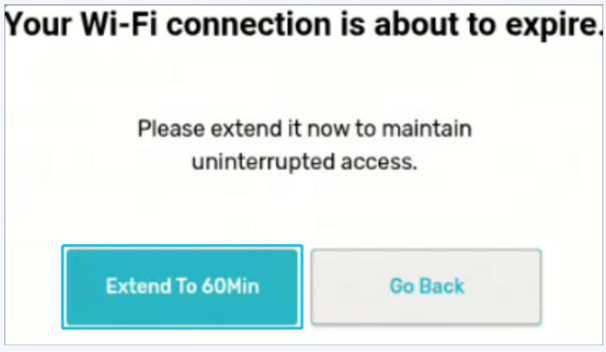
Note

The connection session to the Nexus remains active for 60 minutes. If the installation is not completed within this time, repeat the connection procedure to initiate a new 60-minute session and continue the installation.

To assist the user, a popup warning will appear twice before the session expires:

- The first popup appears 5 minutes before expiration.
- The second popup appears 1 minute before expiration.

Click **Extend To 60Min** to extend the session.



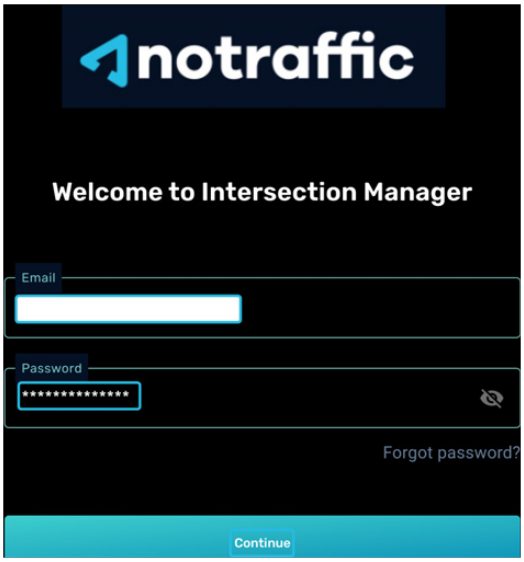
3.3 Launching and Logging into the Installation Manager

To begin configuring the intersection, launch the IM application embedded on the Nexus. Log in using your technician credentials to access the setup and configuration tools.

After connecting to the Nexus via Wi-Fi or Ethernet:

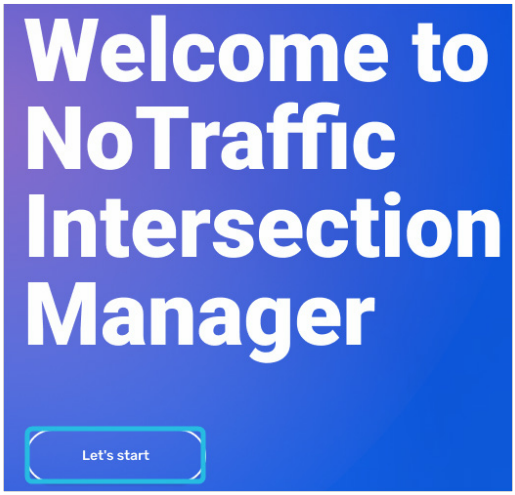
1. On your laptop, open a Google Chrome browser.
2. Access the IM application as follows:
    - Ethernet - type the URL **10.5.0.2:6080** and press Enter.

      On your laptop, go to **Network > Ethernet**. Under **DNS server assignment**, set the option to **Automatic (DHCP)**.
    - Wi-Fi - type the URL displayed by the Nexus and press Enter.
3. On the login screen enter the credentials issued to you by NoTraffic as follows:
    - **Email**
    - **Password**
4. Click Continue.



The welcome window appear sprompting you to begin the setup process.

5. Click **Let's start**.

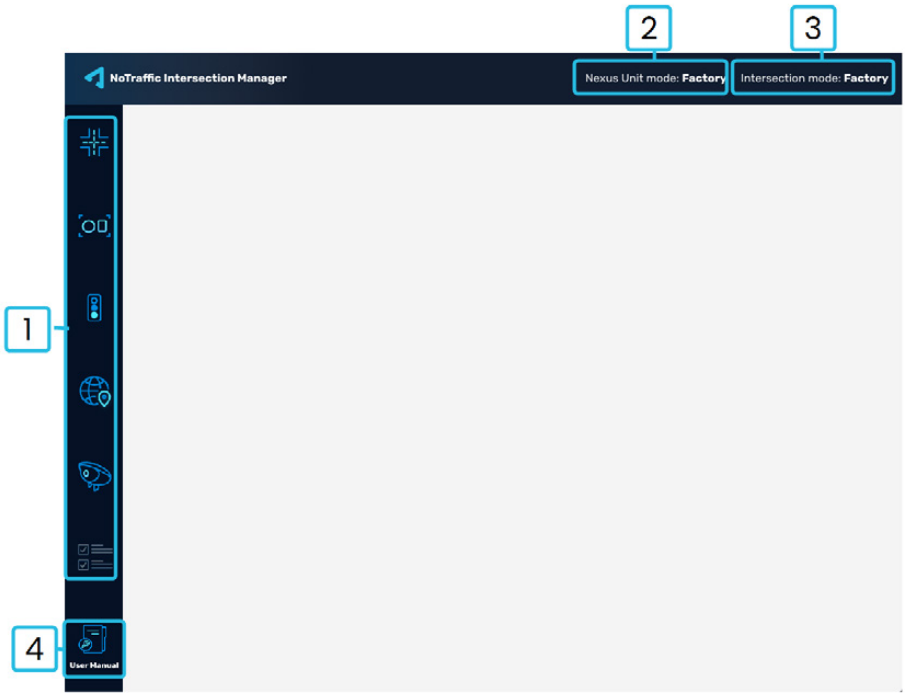


4. Understanding the System Interface and Operation

4.1 Getting to Know the Intersection Manager User Interface

The dashboard opens, providing access to all tools for viewing, editing, and configuring the Nexus, Sensors, and the intersection.

The following image and table describe the dashboard features.



#	Item	Description
1	Navigation Panel	Menu including the following six wizard steps: • Setting up the Intersection. • Configuring the Detection Method. • Configuring the TLS Method. • Setting up City Network. • Configuring the Sensors. • System Tests.
2	Nexus Mode	Displays the mode status of the Nexus, see Section 4.2.1 - Nexus and Sensor Modes

#	Item	Description
3	Intersection Mode	Displays the mode status of the Intersection, see Section 4.2.2 - Intersection Modes
4	User Manual	 Displays the online User Manual.

- After the initial configuration and while in wizard mode, the IM opens on the last screen it displayed.
- The icons on the navigation panel are enabled (illuminated) as you progress through the wizard steps. Uncompleted steps remain greyed out. Forward navigation is restricted, but you can return to previous steps and move between them.
- Once configuration is complete, the IM defaults to the Detection screen when opening.
- Once the wizard is completed (after system tests), you can move back and forth between steps.

Warning
If you navigate back to the **Sensor aiming** after completing it and adjusting the zoom, a warning is displayed. Continuing, deletes all Sensor configurations from the preceding steps, including trajectories, lane-to-phase assignments, and detection zones.

Warning
If you navigate back to the **Ingress configuration** after completing it and change the trajectories, all Sensor configurations from the preceding steps are deleted, including trajectories, lane-to-phase assignments, and detection zones.

4.2 Operational Modes of the Sensors and Nexus, and the Intersection

This section provides an overview of the operational modes of the Nexus and Sensors and the Intersection.

4.2.1 Nexus and Sensor Modes

- **Factory** mode – the default settings configured during production. The units remain in this mode during the installation process until moved to Operational mode.
- **Operational** mode – the Nexus receives detections from Sensors and sends them to the Traffic Signal Controller (TSC). The units remain in this mode until the Intersection switches to Managed mode.
- **Managed** mode – the NoTraffic Mobility Platform connects to the cloud-based Mobility

Operating System, providing access to user interfaces for managing, monitoring, controlling, and reporting, with 24/7/365 support and monitoring.

4.2.1.1 Moving Units from Factory to Operational Mode:

- The **Nexus** switches to Operational mode after setting up the City Network, see Section 7 - Setting up City Network.
- If connection to the city network fails, an error message is displayed, and the intersection installation is blocked, until the error is corrected.

> **Note**
> City Network is optional for Nexus assignment, but if used, all parameters must be valid.

- If successful - the Nexus switches to Operational mode, allowing the user to continue the setup process for the Sensors.
- The **Sensors** switch to Operational mode after:
  1. Completing the Sensor configuration wizard.
  2. Assigning them to the intersection, see Section 9.6 - Assigning the Sensor to the Intersection.

4.2.2 Intersection Modes

- **Factory** Mode – a new intersection with the Nexus and Sensors units not yet installed.
- **Operational** Mode - the intersection enters Operational mode only when all hardware units are in Operational mode, and all required system tests are completed successfully. The intersection cannot switch to Operational mode if any unit (Nexus or Sensor) is not in Operational mode.
- **Managed** Mode – the NoTraffic Mobility Platform connects to the cloud-based Mobility Operating System, providing access to user interfaces for managing, monitoring, controlling, and reporting, with 24/7/365 support and monitoring.

4.2.2.1 Moving the Intersection from Factory to Operational mode

Once the Nexus and all Sensors are in Operational mode and all system tests passed, the intersection automatically switches to Operational mode. At this point, release the TSC from recall mode.

To request the Intersection Registration

1. After running all system tests, the installer sends the intersection registration request.

   The registration request includes the intersection status together with the following information:

   - Unit's information – name and mode
   - Intersection mode - Factory or Operational
   - System tests results
   - GPS location

2. The NOC receives the request and processes it. If an issue occurs, see Appendix E - Troubleshooting.

5. Setting Up the Intersection

Understanding Street name # and Sensor asssignment

A **Street name #** is a combination of a street name and one or two approaches (traffic directions).

- **Example 1**: One street name with two directions is entered as a single **Street name #**:
  - **Steet name #1** - Main Street, two approches: East + West Bound
- **Example 2**: Two street names, each with a different direction, are entered as two separate **Street name #'s**:
  - **Steet name #1** - Main Street, one approch: East Bound
  - **Steet name #2** - Side Street, one approch: West Bound

The number of Sensors installed at the intersection should correspond to the number of traffic approaches being monitored.

Caution

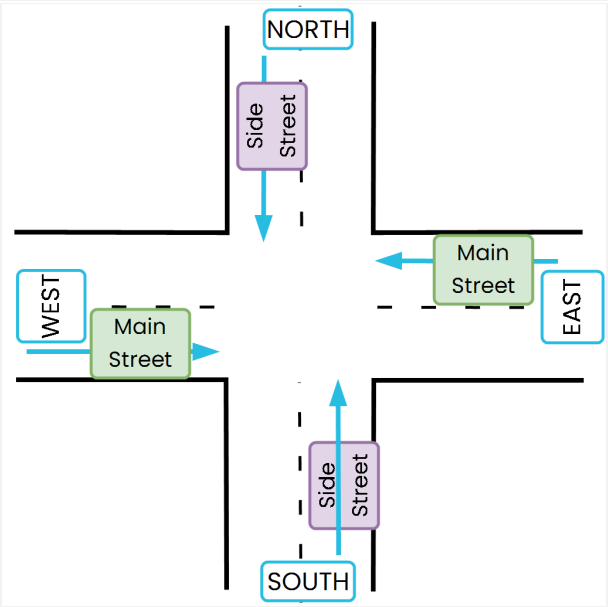
Before saving the intersection setup, **verify** that all information is correct:

- Street name #'s (street names and approach directions)
- Agency and Intersection names
- Installer details

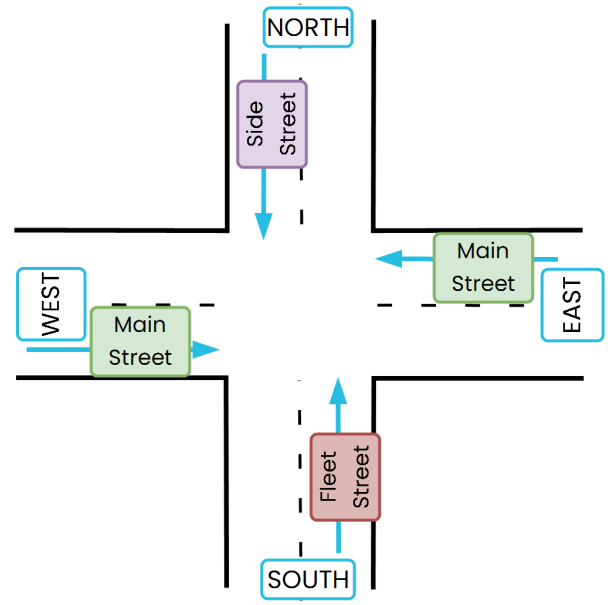
Once saved, **no further changes** to this page are posisble.

Make sure all all information is accurate before proceeding.

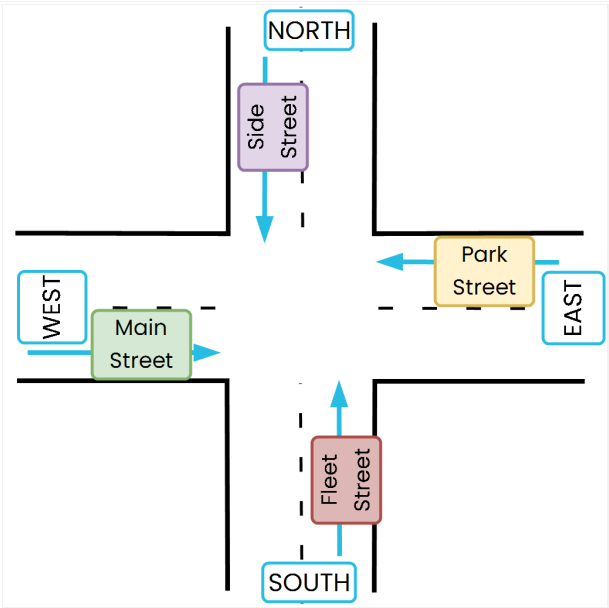
The following table describes the three possible **Street name #** setups with one Sensor installed per approach:



Steet name #1 Main Street
Approach: East + West Bound
Qty of Sensors: **2**
Steet name #2 Side Street
Approach: North + South Bound
Qty of Sensors: **2**
Total Sensors: 4



Steet name #1 Main Street
Approach: East + West Bound
Qty of Sensors: **2**
Steet name #2 Side Street
Approach: South Bound
Qty of Sensors: **1**
Steet name #3 Fleet Street
Approach: North Bound
Qty of Sensors: **1**
Total Sensors: 4



Steet name #1 Main Street

Approach: East Bound

Qty of Sensors: **1**

Steet name #2 ParkStreet

Approach: West Bound

Qty of Sensors: **1**

Steet name #3 Side Street

Approach: South Bound

Qty of Sensors: **1**

Steet name #4 Fleet Street

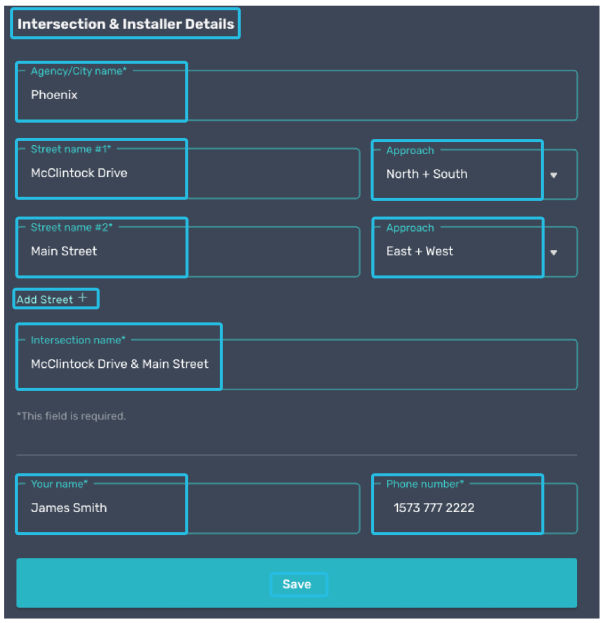
Approach: North Bound

Qty of Sensors: **1**

Total Sensors: 4

5.1 To set up the Intersection:

1. Complete the following **Intersection & Installer Details**:
    - **Agency/City name** (mandatory).
2. Combination of the street name and its approach/es (mandatory).
    - **Street name #1**.
    - In the **Approach** list select the appropriate direction/s associated with the street name being added.

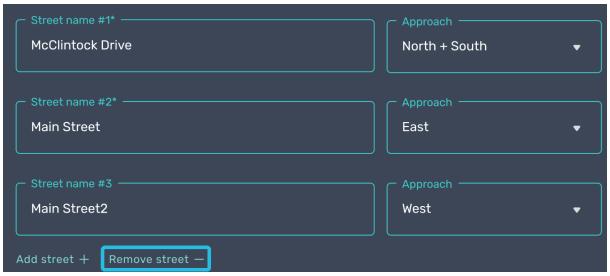


> **Note**
> Enter the **Street name** according to your agency's naming convention. If no convention exists, use the name as it appears in Google Maps or Apple Maps for accuracy.

3. If an additional **Street name #** is needed, click **Add street +** .

> **Note**
> A minimum of two street names #s is required.

4. To remove a **Street name #**, click **Remove street -**.



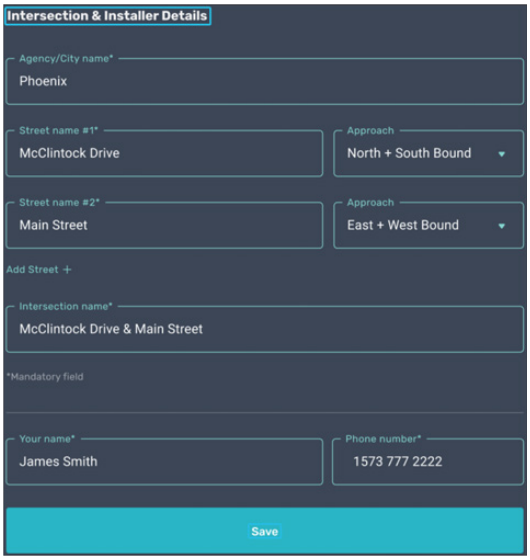
5. **Intersection name** (mandatory).

> **Note**
> The IM automatically generates the **Intersection name** by combining the **Street names** you added. You can edit this name to make sure it is unique and distinctly identifies the intersection.

6. **Your name** (mandatory) - Enter the name of the system installer, who can be contacted by the NOC for follow up.
7. **Phone number** (mandatory).

   Take care to check the following:

   - All street names (**street name #**) have been added and there are no duplicates.
   - The quantity of directions for approaches corresponds to the quantity of Sensors that are to be installed.
   - All details are correct.



8. Click **Save**.

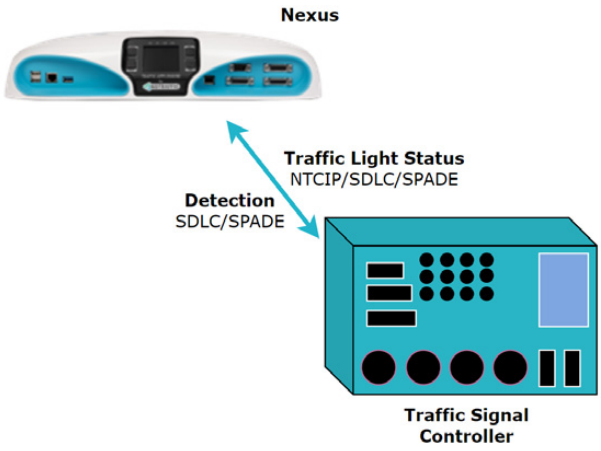
> **Caution**
> Before saving the intersection setup, verify that the **Street name #**'s accurately reflect the physical intersection.
>
> Once saved, **no further changes** to street names or approach directions are possible. Make sure all names and directions are accurate before saving.

You are redirected to the detection page.

6. Configuring Communication of Nexus to Controller

The Nexus communicates with the TSC using one of the following methods:

- Digitally using NTCIP (for OPT/status only; not used for placing calls)
- Serially using SDLC
- Analog using SPADE



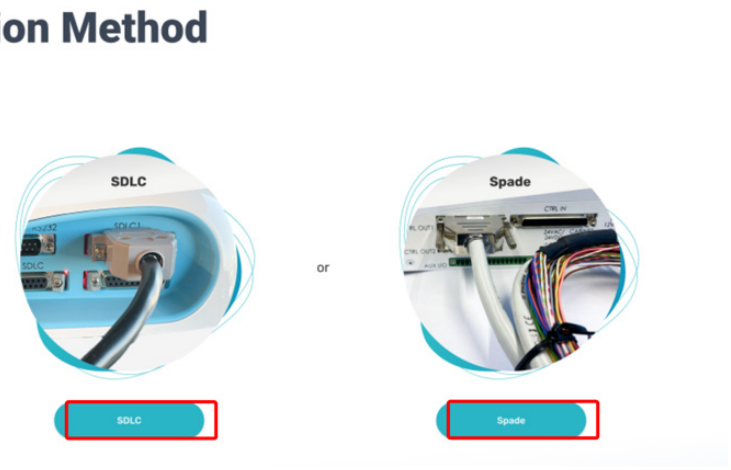
Detection uses SDLC or SPADE.

TLS uses NTCIP, SDLC or SPADE.

6.1 Selecting the Detection Method

Select one of the following detection methods based on the available TSC interfaces:

- **SDLC**
- **Spade**



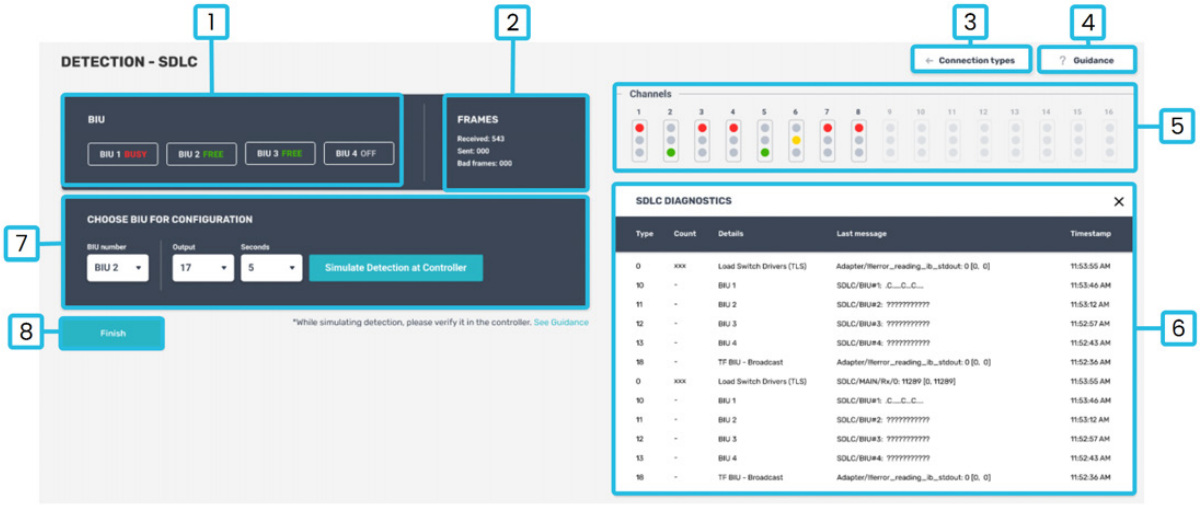
If a detection method is already configured, a message prompts you to either confirm your current selection or cancel and return to the detection selection window. See Appendix B.1 – TLS Selection Warning.

Tip

During configuration, you can return to the Detection Method selection by clicking **Detection methods**.

6.1.1 Setting up Detection – SDLC

The following figure and table describe the **Detection – SDLC** screen.

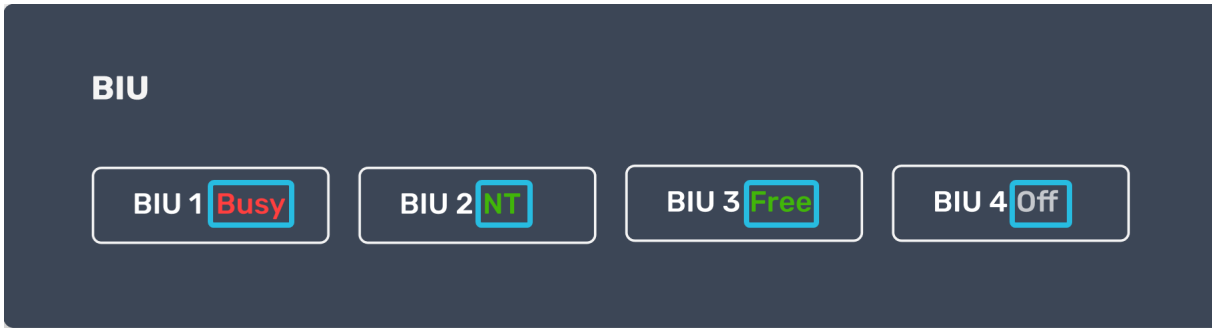


#	Item	Description
1	BIU	Displays four BIUs and their status (see Section 6.1.1.1 - BIU - Bus Interface Unit).
2	Frames	Displays the count of how many frames are transmitted (received, sent, bad) on the SDLC bus. **Note** Observe the **Frames** status. The counter for received frames must increase continuously. If no frames are received or the count stops (no SDLC communication), refer to Section 12.2 - Detection Failure and Section Appendix A - BIU Communication and Configuration
3	Connection types	Returns to the **Detection Method** window (page).
4	Guidance	Displays help menu.
5	Channels	Displays the status (red, yellow, green) of each load switch (channels).
6	SDLC Diagnostics	Displays messages transmitted on the SDLC bus.
7	Choose BIU for configuration	Select a BIU and simulate detection. Each BIU has 16 outputs (detectors).
8	Finish	Saves the configuration and moves to the next page. Closes the DETECTION - SDLC window.

6.1.1.1 BIU - Bus Interface Unit

The Nexus acts as a BIU device from the controller's perspective.

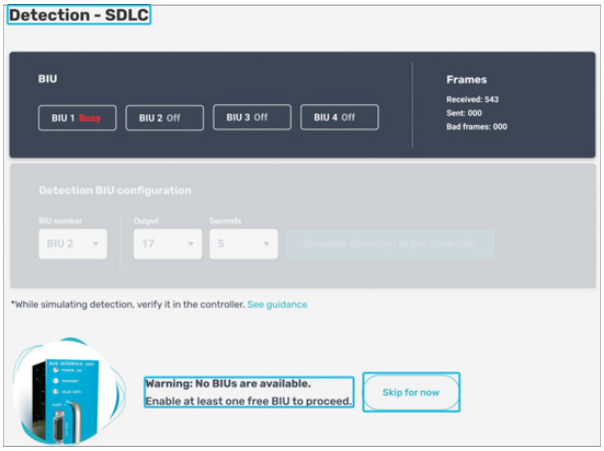
The IM displays the status of four BIUs as follows:



- **Busy** (red) - BIU is used by another system and cannot be used by NoTraffic.
- BUSY **NT** (green) – BIU is temporarily used by the NoTraffic simulation.
- **Free** (green) - BIU is free to be used by NoTraffic.
- **Off** (gray) - BIU is not enabled in the controller programming.

Note
BIUs with the status BUSY (red) or OFF (gray) are not available for NoTraffic use and cannot be selected as a BIU.

1. If none of the BIUs, are free (green), do one of the following:
   - Enable an OFF (gray) BIU in the controller. Refer to the guidance in Section 12.1 - No BIUs Available.
   - Free a BUSY (red) BIU by removing an old system from the cabinet.
   - Click **Skip for now** to skip this step.

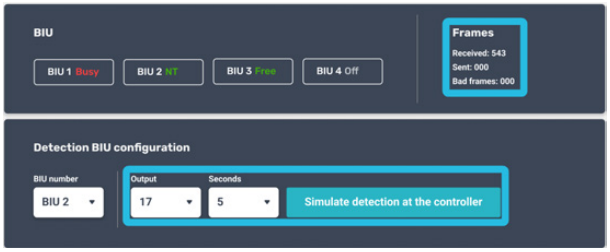


2. To select a BIU for detection configuration:

   - You must select a BIU that is **Free** (green) from the **BIU number** list.

3. To simulate a detection:

   - In the **Output** list, select an output number linked to the free (green) BIU to place a test call on it.



BIU	Outputs	SIU	Outputs
BIU 1	1-16	SIU 1	1-24
BIU 2	17-32	SIU 2	25-48
BIU 3	33-48	SIU 3	49-72
BIU 4	49-64	SIU 4	73-96
		SIU 5	97-120

   - In the **Seconds** list select the time to simulate the detection for this **Output**.

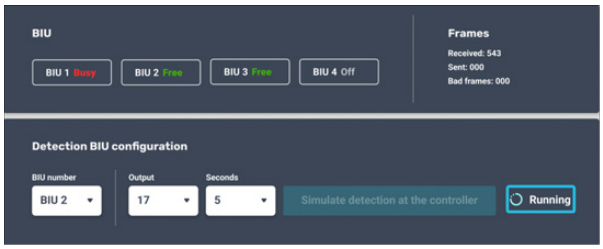
Tip
Make sure the selected time is sufficient for you to reach the controller.

   - Click **Simulate Detection at Controller**.

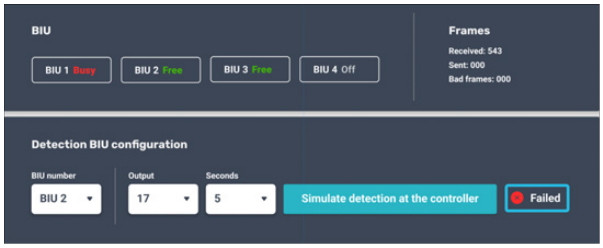
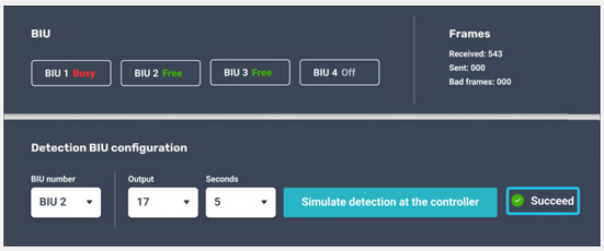
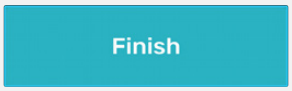
Tip
In SDLC detection there are two ways to verify the simulation is working:

   - In the controller, verify the detector is on, see Section - 12.2 Detection Failure.

4. Wait for the selected time while the simulation is **Running**.



5. After the selected simulation time has passed, a final response is displayed. The following table describes the actions to take during the entire process.

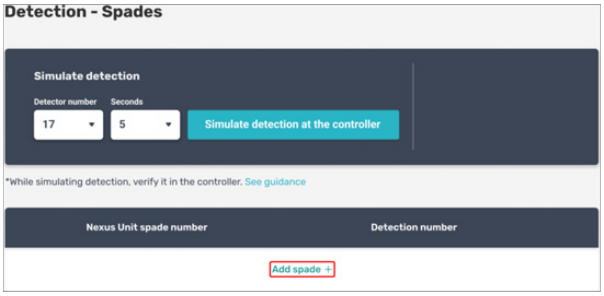
Response Displayed	Response State	Action
	**Failed**	Do one of the following: • Retry • See Section 12.2 - Detection Failure • Contact the NOC, see Appendix C - Regular and Diamond Intersections.
	**Succeed**	Click **Finish**. 

Warning
You must place a successful test call before drawing detection zones. This is required for the system test to pass.

6.1.2 Setting up Detection – SPADE

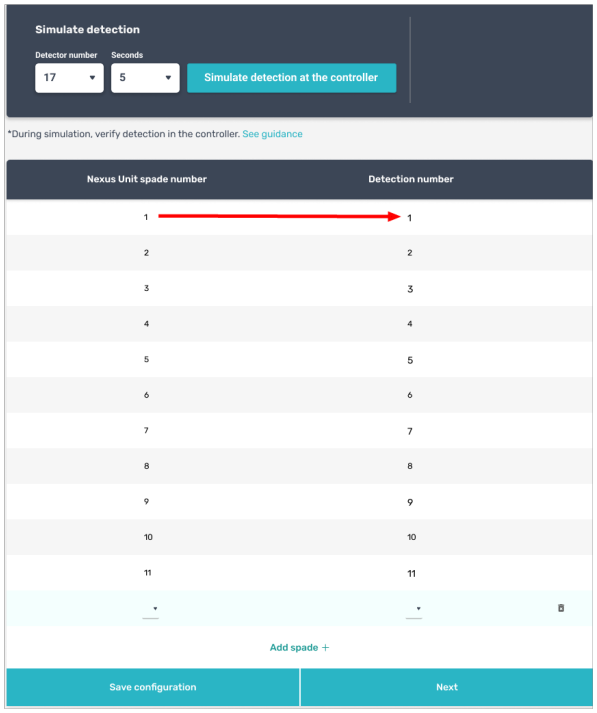
To configure SPADE Detection:

1. Click **Add spade +**.



2. Select a **Nexus spade number**. This is the Nexus output number.
3. Select a **Detection number**. This is the controller detector number.

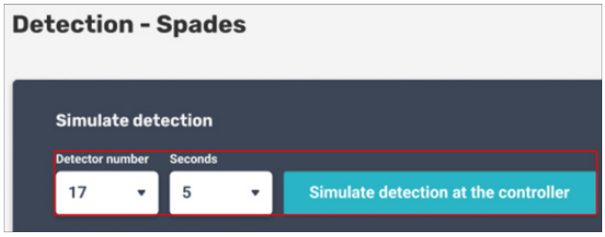
   Repeat steps 2 to 3 to add each spade number individually. Make sure you configure all detectors in use.



> **Note**
> You cannot simulate an output that is not displayed in the DETECTOR NUMBER column.

To simulate a detection

1. In the **Detector number** list select a detector number.
2. In the **Seconds** list select the time to simulate the detection for this output.

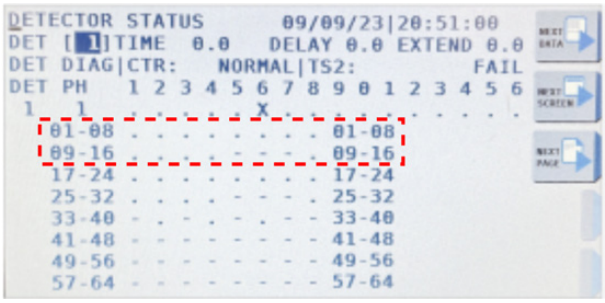


> **Tip**
> Make sure the selected time is sufficient for you to reach the controller.

3. Click **Simulate Detection at Controller**.

> **Note**
> You must run at least one simulated detection for the system test to pass

4. Check on the controller screen that the selected **Detector number** (indicated by an **X**) is working. See Section 12.2 - Detection Failure for guidance on how to view the detector status.



> **Tip**
> Best practice - repeat steps 1 to 4 for all SPADE detectors in use.

5. Click **Finalize Configuration**.

6.2 Selecting the TLS Method

The following window is displayed in the first wizard session.

- Select a TLS method from the following option, in order of preference:
  - NTCIP - preferred method, if supported by the controller.
  - SDLC -use if NTCIP is not supported.
  - Spade - use only if neither NTCIP nor SDLC is available.

After completing the initial wizard, if you decide to change the TLS method, a message prompts you to either confirm your current selection or cancel and return to the detection selection window. See Section B.1 - TLS Selection Warning.

Tip

During configuration, you can return to the TLS Method selection by clicking **Connection types.**

6.2.1 Setting up TLS – NTCIP

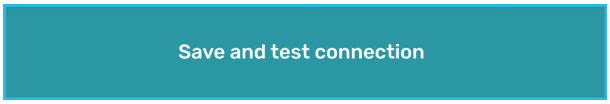
Select and enter the parameters for the **Controller** and **NoTraffic** networks fields.

1. Select and enter **Controller IP**. The IP address on the network.

> **Note**
> Most controllers include an ENET 2 port, which is the preferred connection for this setup.
> If connecting through a switch, an IP address must be assigned by the City's IT or network administrator.

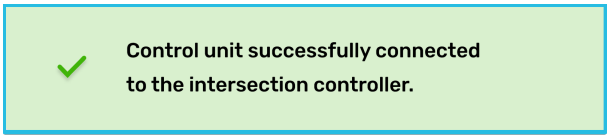
2. Select and enter the **Controller port**. This is the port used by the controller for NTCIP communication.
    - For Econolite controllers, the default port is **501**.
    - For most other controllers, the default is typically **161**.

   To confirm the correct port, check the controller's configuration menu—this is usually found under the Communications or SNMP Settings submenu.
3. Select and enter **Community**. The default is **public**, but this may vary. If uncertain, check the NTCIP menu on the controller to view the configured community name.
4. Select and enter **NoTraffic IP**. The IP of the Nexus is provided by the city/client.
    - If connecting directly to the controller, use an IP address on the same network as the controller.
    - If connecting via a city-owned switch, the IP address must be assigned by NoTraffic.
5. Select and enter **NoTraffic Netmask**.
6. Select and enter **NoTraffic Unit Gateway**.
7. Click **Save And test Connection**.



.

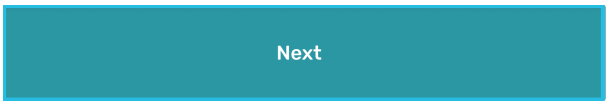
8. When **successfully connected,** check all channels, phases and overlap are active and running. Make sure each **Phase** color status and timing changes are synchronized with the actual traffic light head's color and timing changes.



9. If the **connection to the controller failed**, contact the NOC, see Section Appendix C - Regular and Diamond Intersections to resolve the issue.

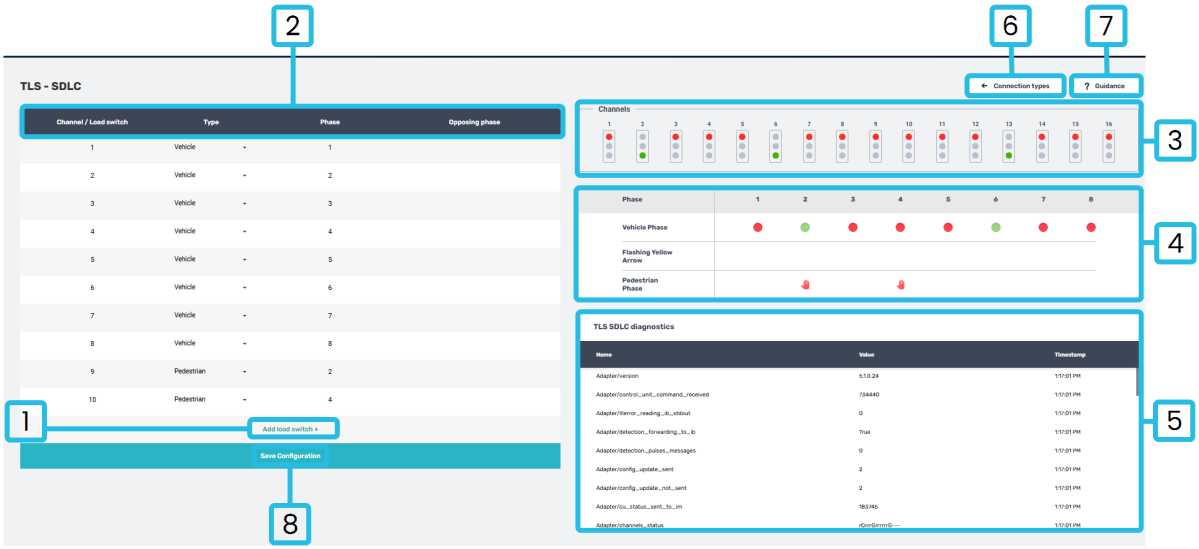
10. Click **Next**.

    The display refreshes and moves to Setting up City Network.



6.2.2 Setting up TLS – SDLC

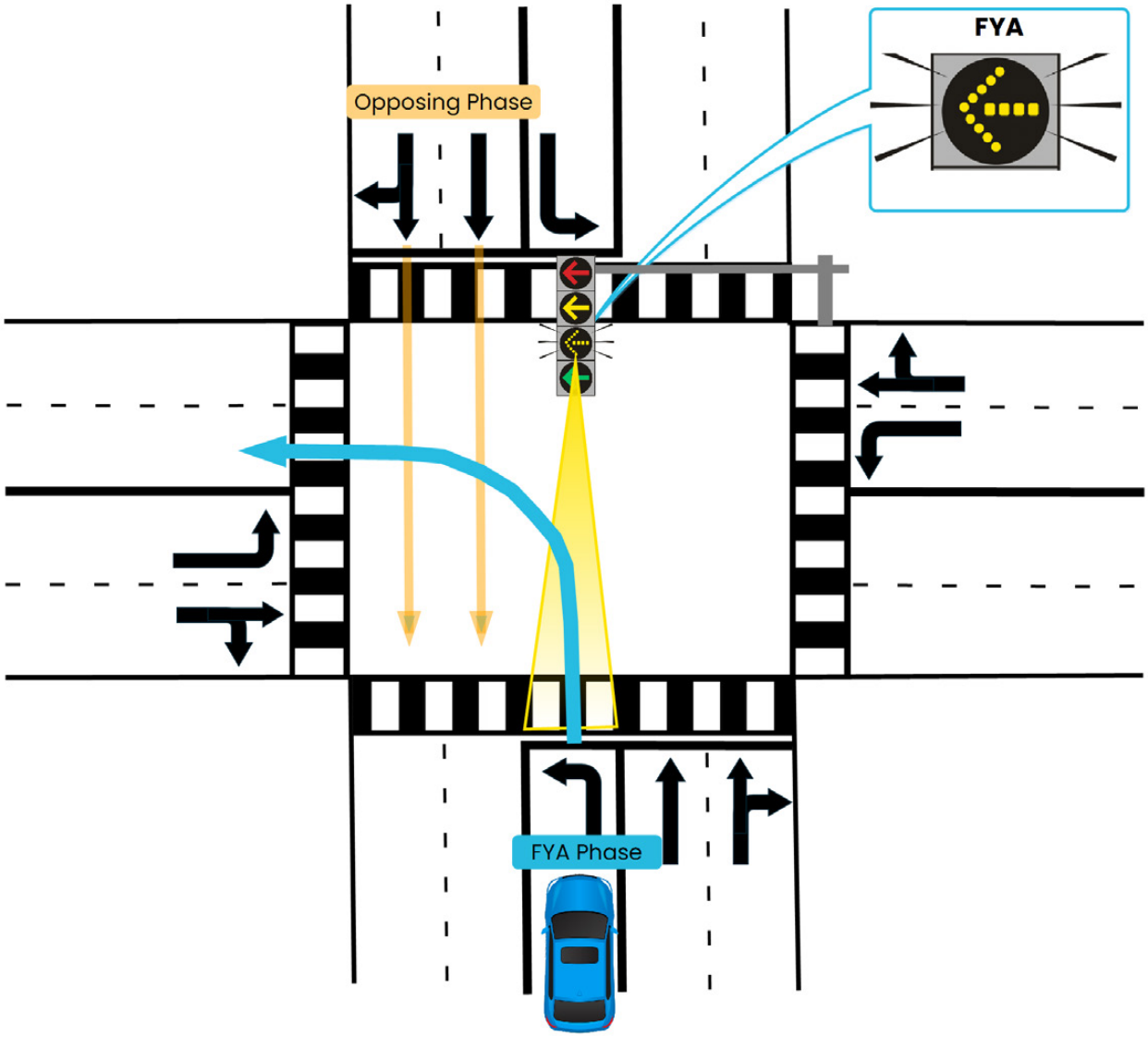
The following figure and table describe the **TLS – SDLC** screen.



#	Item	Description
1	Add load switch +	Displays the add load switch window to map channels to types and phases.
2	Mapping Table	Displays the relational status of the Channel/Load switch), Type, Phase and Opposing phase.
3	Channels	Displays the status (red, yellow, green) of each load switch (channel).
4	Table of mapped phases to types	Displays the status of phases with relation to types (Vehicles, Flashing Yellow Arrow, Pedestrian).
5	TLS- SDLC Diagnostics	Displays messages transmitted on the SDLC bus.
6	Connection types	Returns to the Detection Method window (page).
7	Guidance	Displays help menu.
8	Save Configuration	Saves the configuration and moves to Setting up City Network.

To configure TLS - SDLC

1. Click **Add load switch +**.
2. Select the **Channel/Load switch**.
3. Select the **Type** (Vehicles or Flashing Yellow Arrow or Pedestrian).
4. **Select the Phase** (1 to 8) that is connected to this channel (load switch).
5. If the type is **FYA** you must select the **Opposing phase** (1 to 8) that controls the conflicting through movement connected to the same load switch (channel). The opposing phase typically refers to the phase that vehicles encounter when traveling in the opposite direction through the intersection.



As phases are added (mapped), the table of phase-to-type mappings updates immediately on the screen to display the actual status. Check the phases are active and running. Make sure each Phase's color status and timing changes are synchronized with the actual traffic light head's color and timing changes.

6. Repeat steps 1 to 5 for all channels (load switches) in the cabinet. This is limited to a maximum of 16 lines.

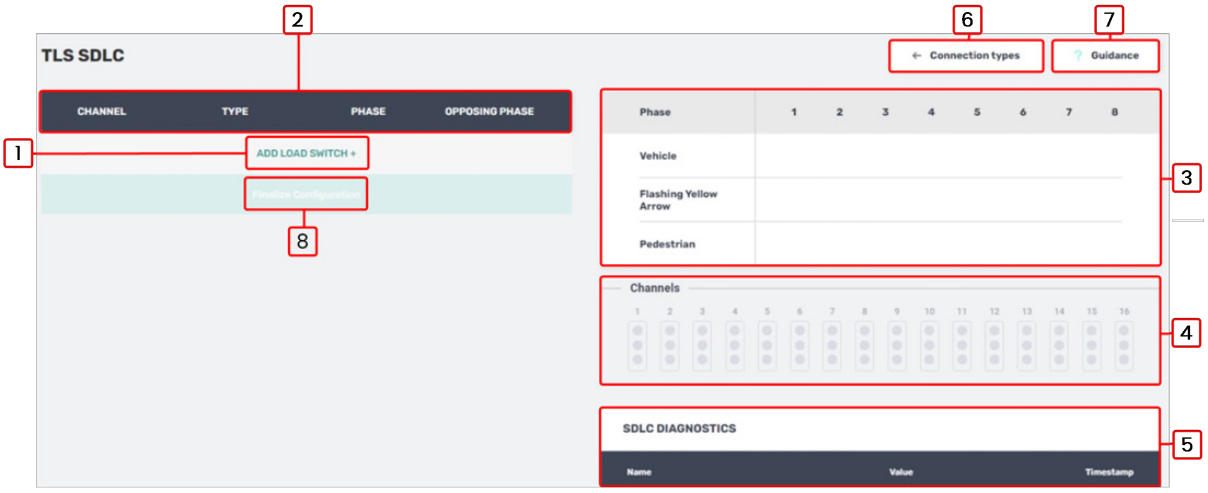
   Take care to check all the channels (load switches) are populated.

7. Click **Save configuration**.
8. Click **Next**.

   The display refreshes and moves to Setting up City Network.

6.2.3 Setting up TLS – Spade

The following figure and table describe the **TLS – Spade** screen.



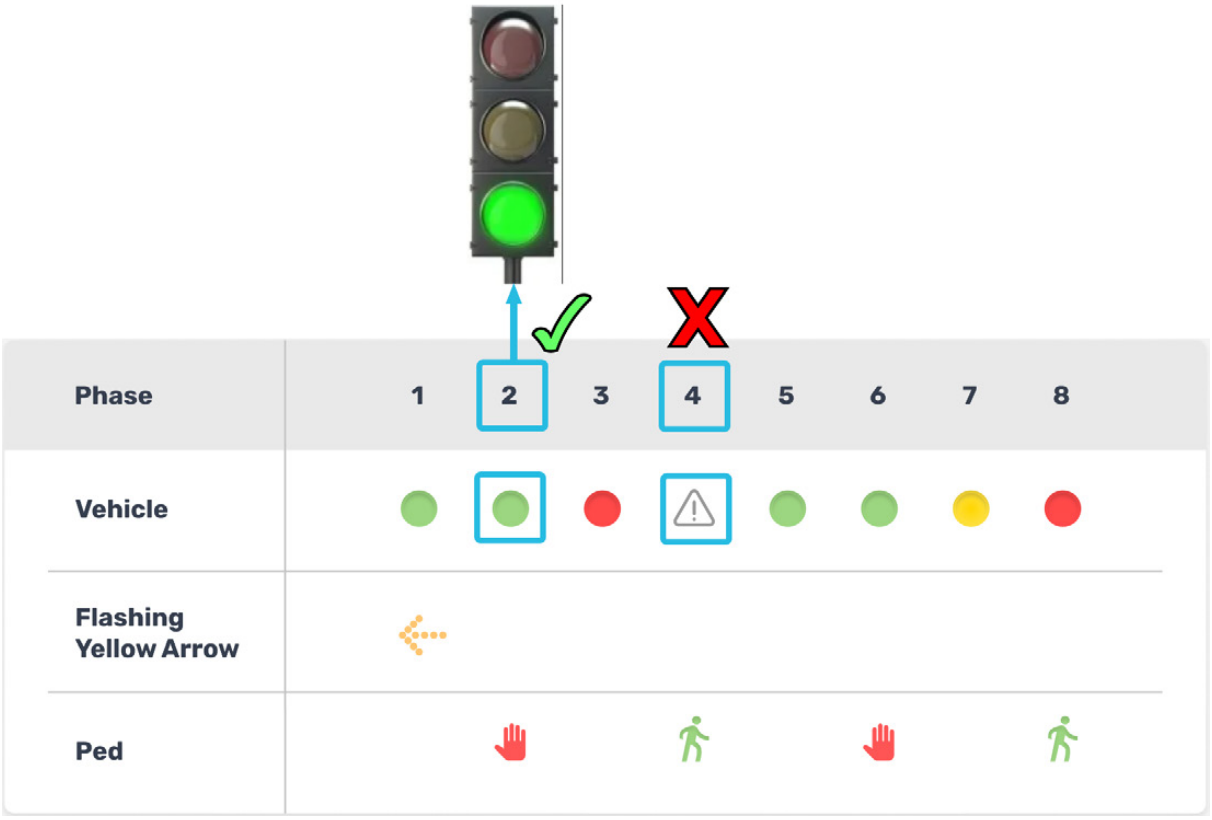
#	Item	Description
1	Add pin +	Displays the add pin window to map the controller output pins (output file) to the type and phase.
2	Mapping Table	Displays the relational status of controller output pins to the type and phase. **Note** The opposing phase is not currently in use and is reserved for future implementation.
3	Table of mapped phases to types	Displays the status of phases with relation to types (Vehicles, Flashing Yellow Arrow, Pedestrian).
4	Pin Table	Displays the status (blue or gray) of each controller output pin.
5	SDLC Diagnostics	Displays messages transmitted on the SDLC bus.
6	Connection types	Returns to the Detection Method window (page).
7	Guidance	
8	Finalize Configuration	Saves the configuration and moves to the next page. Closes the TLS - SPADES window.

To configure TLS - Spades

1. Click **Add pin +**.
2. Select the **Controller Output pin (Output file).**
3. Select the **Type** (Vehicles or Flashing Yellow Arrow or Pedestrian).
4. Select the **Phase** (1 to 8) that is connected to this pin (load switch) on the traffic light head.

As phases are added (mapped), the table of phase-to- type mappings updates immediately on the screen to display the actual status. Check the phases are active and running. Make sure each Phase's color status and timing changes are synchronized with the actual traffic light head's color and timing changes.

For example, Phase two is correct, and Phase four is incorrect and must be remapped.



5. Repeat steps 1 to 4 for all pins (load switches) in the cabinet. This is limited to a maximum of 50 lines.

   You must add three pins, one for each of the red, yellow and green traffic light head's load switches, and two pins for each pedestrian head's load switches.

Controller output pin (output file)	Type	Phase	Opposing phase
1	Vehicle - Red	1	
2	Vehicle - Green	2	3 pins for the phase
3	Vehicle - Yellow	3	

6. Take care to check all the pins (load switches) are populated.

7. Click **Save Configuration**.
8. Click **Next**.
9. The display refreshes and moves to Setting up City Network.

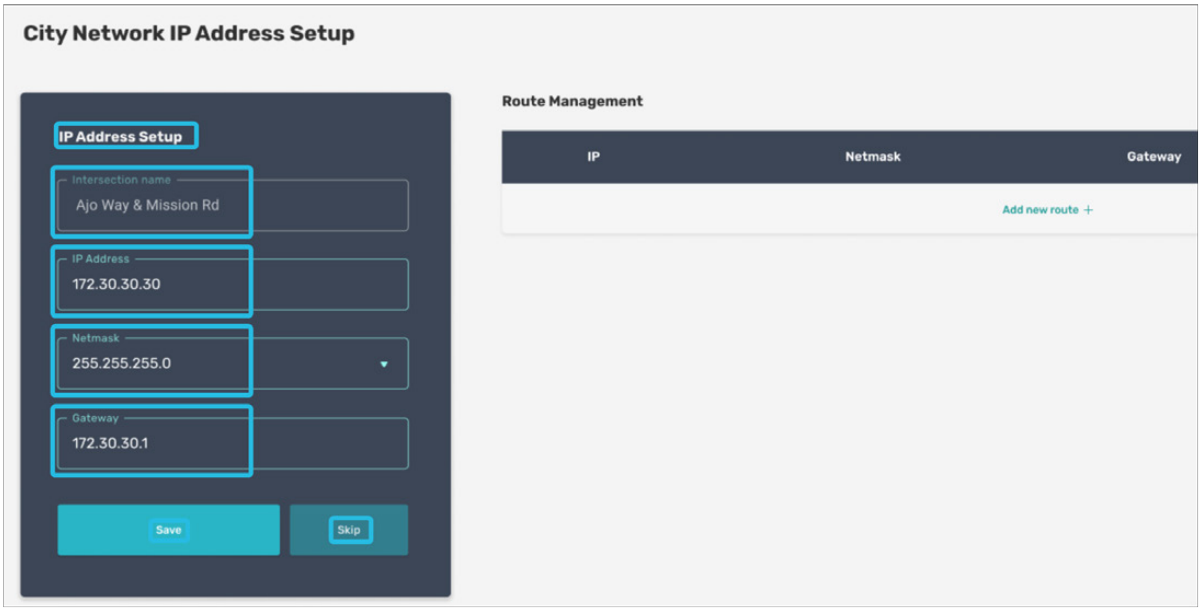
7. Setting up City Network

Setting up the **City Network** is optional. If you do not need to connect to the city network – click **Skip**.

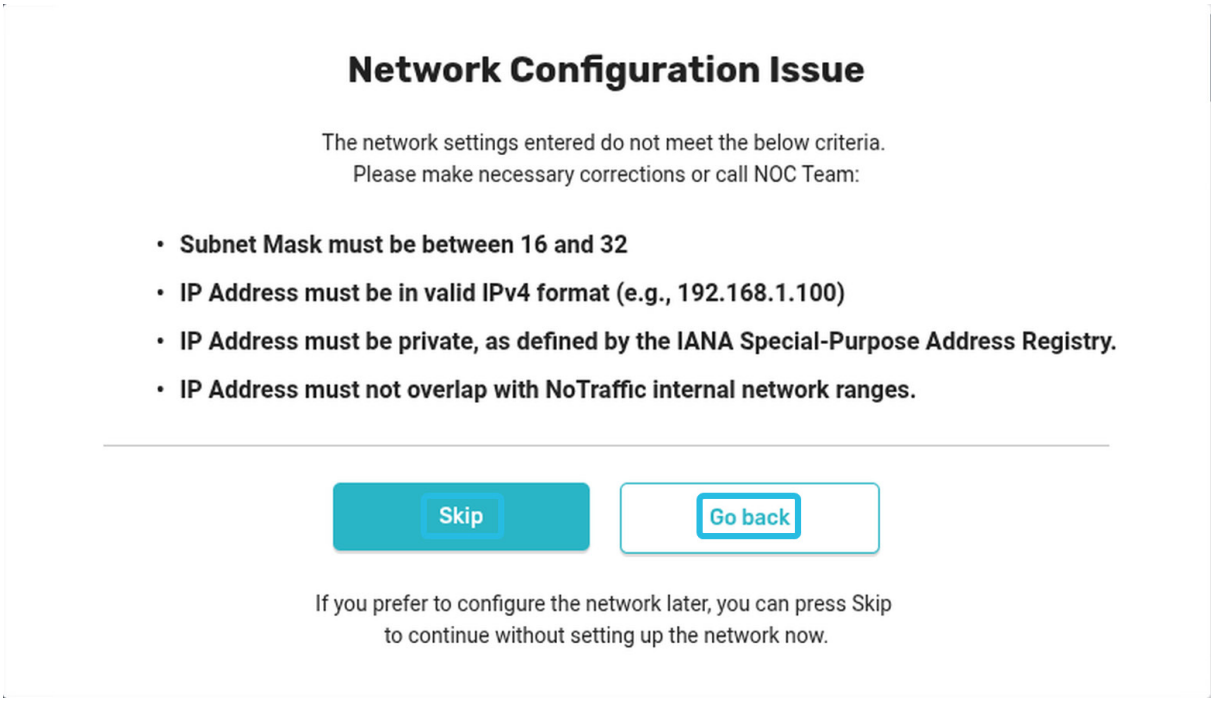
Note
To set up the city network in the cabinet you need to connect an ethernet cable from the City switch to port #5 in the NoTraffic switch.

1. On the side navigation bar, click  .
2. The **Intersection name** is automatically populated by the software as described in Section 5.1 - To set up the Intersection:.
3. If the City or agency requests that the system be connected to their WAN, the following values must be provided by the City or agency's network administrator.
   a. Click **IP Address** and enter the address.
   b. In the **Netmask** list select the netmask.
   c. Click **Gateway** and enter the address.

   If not required, leave these fields unchanged.
4. Click **Save**.



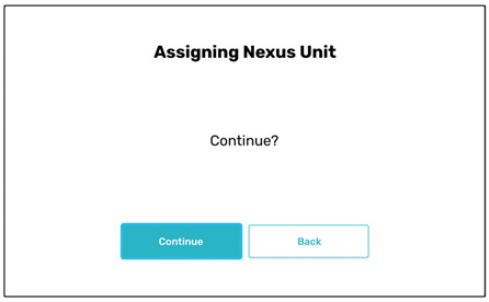
If incorrect parameters are entered, the following error message displays:



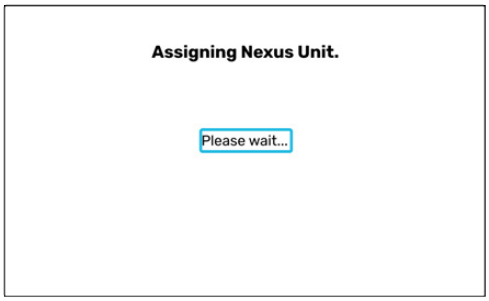
Click **Go Back** to review and correct the network settings, or click **Skip** to skip this step.

8. Assigning the Nexus

1. Click **Continue** to assign the Nexus.

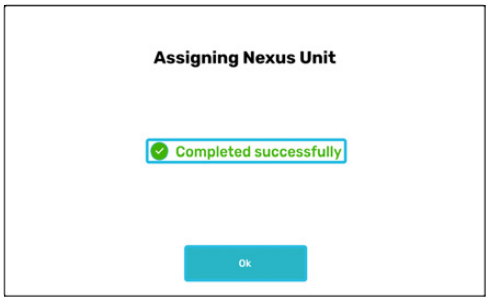


2. Wait while the system attempts to assign the Nexus.

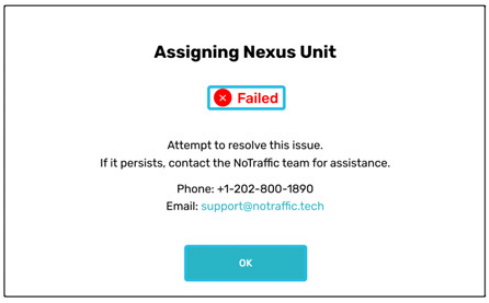


3. If **Completed successfully**, click **Ok**

> **Note**
> The assignment process takes up to 4 minutes and automatically retries if needed



4. If **Failed**, click **Ok**. You cannot continue and must contact the NOC, see Appendix C - Regular and Diamond Intersections.



9. Configuring the Sensors

Sensors are supplied in factory mode by default. After physically installing a Sensor at an intersection, it must be configured. Configuration involves five sequential steps:

- Sensor aiming
- Sensor calibration
- Ingress configuration
- Approach setup
- Detection zones

Overview of the Configuring Stage

- Initial Setup
- When you begin the configuration process, the initial window below is displayed.

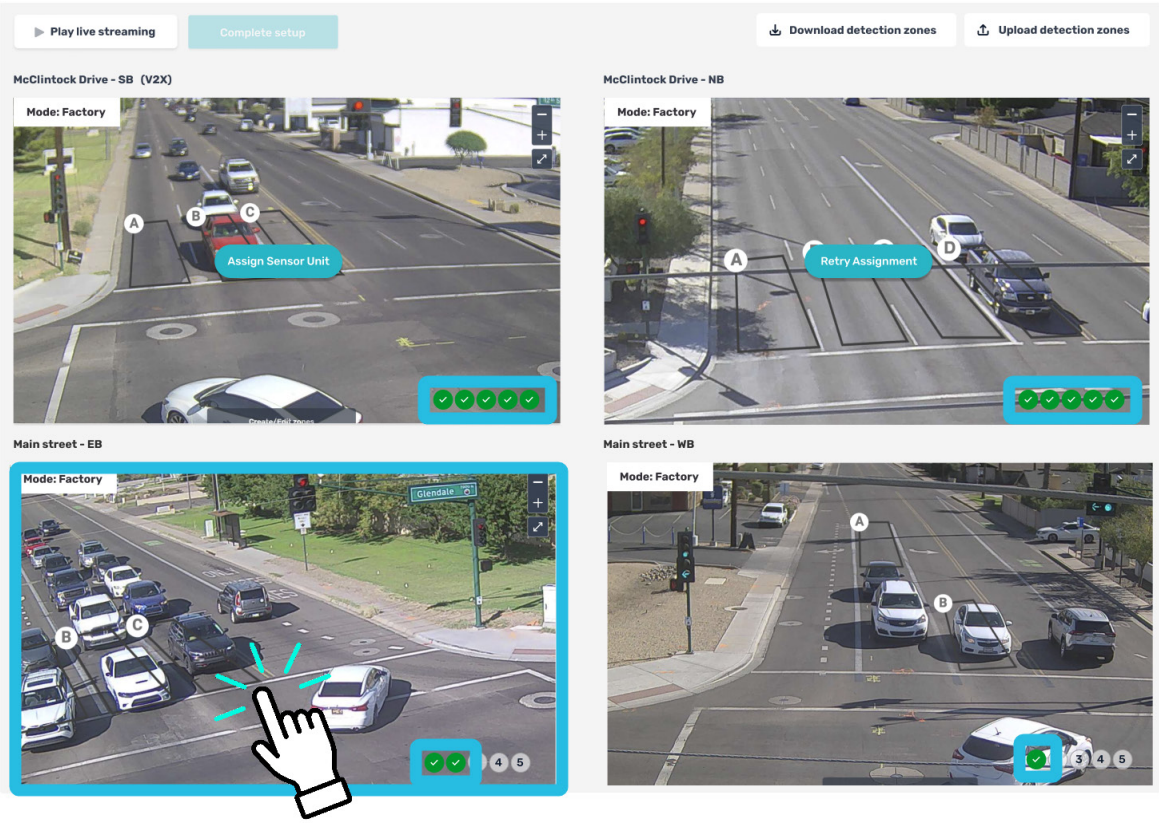
Note
In wizard mode, this screen appears only once with the message **Let's start**. Afterward, the system skips to step 2.

1. Click **Let's Start**.

   You must select a Sensor to configure. The camera views of all connected Sensors are displayed in a quad view.

2. Click the video feed of the Sensor you want to configure.

   - Each Sensor displays its own configuration progress in the lower-right corner of its screen view, indicated by a set of green check marks. These marks represent completed steps for that specific Sensor only — not for the entire intersection or other Sensors.



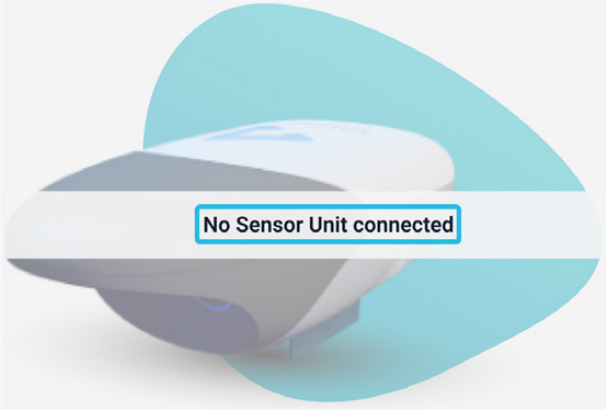
Note

Initially, the Sensor's name is its hardware ID.

After assigning a name in the **Sensor aiming** step (see Section 9.1 - Sensor Aiming), the Sensor name replaces the hardware ID.

Note
A Sensor can only be assigned after completing all five configuration steps, see Section 9.6 - Assigning the Sensor to the Intersection.

Note
If no sensor is detected, the **No Sensor Unit connected** window appears. To resolve this, make sure that at least one Sensor is properly connected and powered.



Navigation Features During Configuration

Two navigation tools in the top right of the screen are available throughout all five configuration steps:

Intersection view

- Click Intersection view to return to the quad view window which displays all Sensor camera feeds.

Guidance

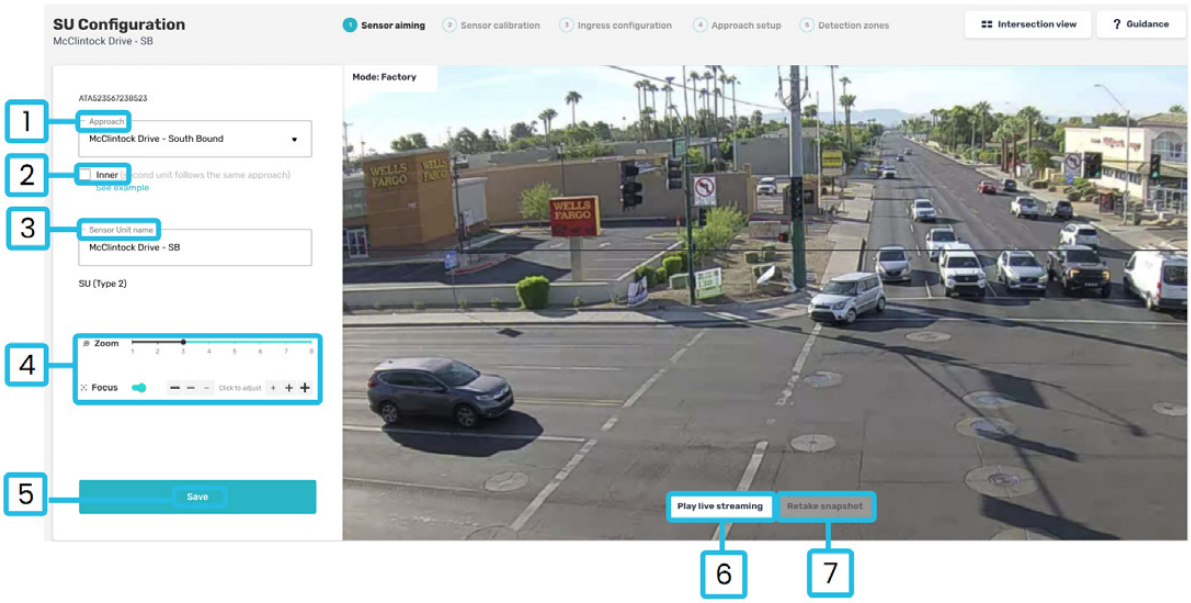
- Click Guidance to access the on-site Sensor aiming video guide. The guide includes the following:
  - Connect the Sensor and manually adjust the view to capture oncoming traffic.
    - Avoid framing the sky.
    - Avoid including interfering objects.
  - Lock the Sensor in position, and make sure it remains stable after locking.
  - Focus the camera using the +/- buttons.

> **Note**
> Set up Zoom before adjusting Focus. Adjusting the camera focus is only necessary if the vision appears out of focus.

- Set the stop line, draw trajectory lines, and set Detection Zones.

9.1 Sensor Aiming

The following figure describes the Sensor aiming screen.



#	Item	Description
1	Approach	Select the direction of traffic flow the Sensor monitors.
2	Inner	Select if more than one Sensor is viewing the same approach.
3	Sensor name	Confirm or edit the Sensor name.
4	Zoom and Focus	Use to zoom and focus the camera manually.
5	Save	Click to confirm and save the Sensor configuration.
6	Play live streaming	Video control function that shows the live stream video feed from the selected Sensor.
7	Retake snapshot	Captures and freezes the current frame for aiming and alignment purposes.

9.1.1 Approach

1. In the **Approach** list, select the street name and direction combination. When two directions (**Approaches**) have been assigned to a **street name #**, for example north + south bound; two

street name and direction combinations are displayed for selection, one for each of the street's directions (north + south). See SU assignment in Section 5 - Setting Up the Intersection.

Note
Make sure you select the street name and direction combination for the Sensor you are aiming.

9.1.2 Inner

If more than one Sensor is viewing the same approach, there are two intersection configurations as follows:

1. **Regular** (non-diamond) intersection - make sure each Sensor is assigned a unique Sensor name and do not select any Sensor as **Inner**.
2. **Diamond** Intersection - you must designate one of the Sensors as the inner. Select **Inner** for the first Sensor in the approach.

See Appendix C - Regular and Diamond Intersections for explanation of the two types.

9.1.3 Sensor Name

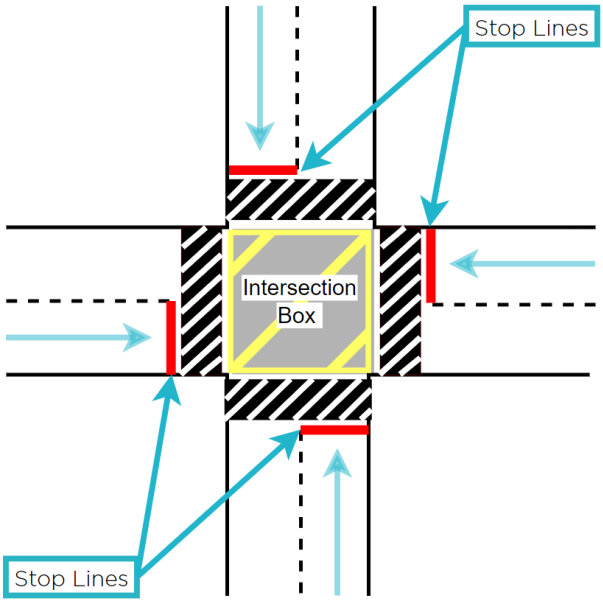
The IM automatically generates the **Sensor name** by combining the street name and direction combination you selected in step 1. You can edit this Sensor name to make sure it is unique and distinctly identifies the street for this Sensor.

Note
- **Sensor name** should not contain spaces.
- Changes to the approach selection reset it to its default name.

9.1.4 Zoom and Focus

The **Zoom** and **Focus** controls are used to aim the Sensor. When aiming, make sure the following two key features are properly accounted for:

- **Intersection Box**
- **Stop Lines**



To configure Zoom and Focus:

1. Click and slide the zoom bar to adjust the camera zoom. Make sure the camera is fully zoomed out.

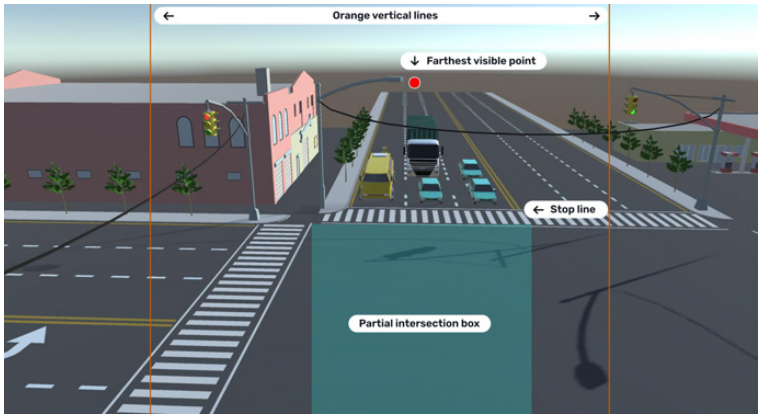
> **Tip**
> Recommend doing this in live streaming mode.

2. Aim the Sensor so that the Stop Line and Intersection Box are centered between the two orange vertical lines.

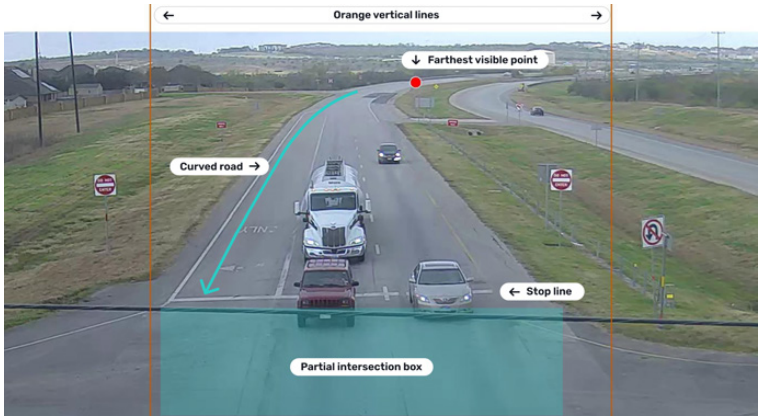
> **Note**
> The entire Intersection Box does not need to be visible in a single Sensor's view. Capturing approximately half of the box is sufficient, as full coverage is achieved through the combined view of all four sensors.

> **Note**
> To enable **Ped Protect**, the entire crosswalk must be visible.

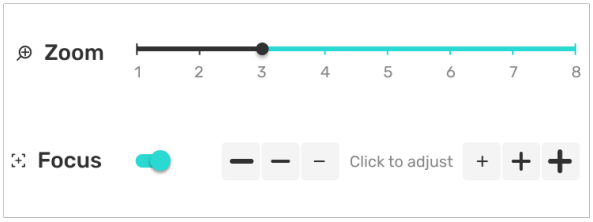
3. Adjust the red dot by moving it toward the farthest visible point of the approaching road, without compromising step 2.



For curved roads: Make sure the aiming follows the road's natural curvature and does not shift too far to the right or left. The Sensor must still capture approaching vehicles as they enter the intersection.

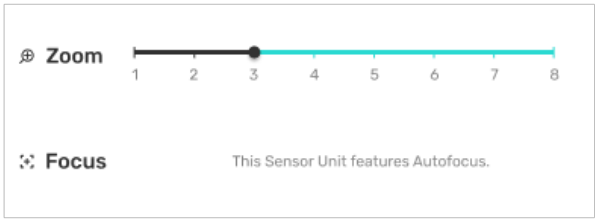


4. Zoom & Focus:
   a. **Zoom** in until the Stop Line is positioned midway between the two orange vertical lines, with its width spanning at least half the distance between them.
   Make sure the Stop Line remains within the orange vertical lines.
   b. **Focus** adjustment is manual or automatic, depending on the hardware and agency setup:
      i. **Manual focus** - some Sensor require manual focus. If your Sensor supports manual focus, use the **+** and **–** icons to adjust focus.



> **Tip**
> Perform adjustments in live streaming mode for best results. Before adjusting, unlock the focus using the toggle. A warning message appears when unlocking.

      ii. **Auto focus** – some Sensors are equipped with auto-focus. In this case, the system automatically adjusts focus and displays a spinner while the image refreshes. No manual focus adjustment is needed.



> **Note**
> Focus can only be adjusted during the calibration step in the setup wizard. To change focus afterward, exit calibration mode in the NOC Tools.

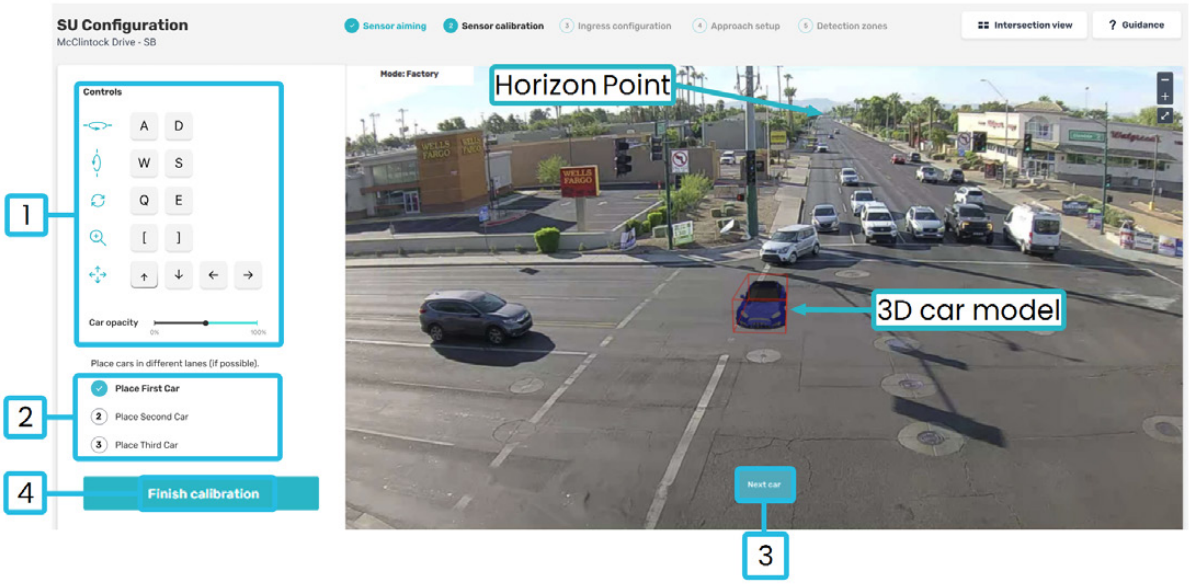
9.1.5 Save

1. Click **Save**. You are redirected to **Sensor calibration**.

> **Warning**
> If you return to the the **Sensor aiming** step after completing it and adjusting the zoom, a warning is displayed. Continuing deletes all Sensor configurations from the previous steps, including trajectories, lane-to-phase assignments, and detection zones.

9.2 Sensor Calibration

In this step, you calibrate the distance and dimensions captured by the Sensor into real-world measurements. The following figure describes the Sensor calibration screen.



#	Item	Description
1	Contols	Contol tools for car placemen.t
2	Select car	Select the car to be placed.
3	Next car	Select to place the next car.
4	Finish calibration	Click to confirm and save the Sensor calibration.

Placing and Adjusting 3D Car Models

Three 3D car models must be placed in the scene to serve as reference points for detection. The 3D car models must be positioned at different locations within the lane or different lanes (if possible) for optimal detection accuracy. During placement, each 3D car model can be rotated, scaled, and aligned as needed.

1. Click **Place First Car**. Then position and place the 3D car model as described below. Make sure that **at least three** 3D car models are placed in different positions for accurate detection.

> **Tip**
> Double-click the approximate car location to speed up the placement process.

Note
Preferred locations:

- Near the stop line – Just behind the visible stop line in the screen view.
- Midway in the lane – Approximately in the center of the lane.
- Far back in the lane – Near the horizon point.

2. Move the 3D Car Model.
   - Press ← (left) and → (right) to move sideways.
   - Press ↓ (down) and ↑ (up) to move forward or backward.
3. Align the 3D Car Model with the traffic flow direction by matching its orientation with the visible vehicles in the screen view. Make sure the 3D car model is parallel to the street lanes and aligned with the horizon point.

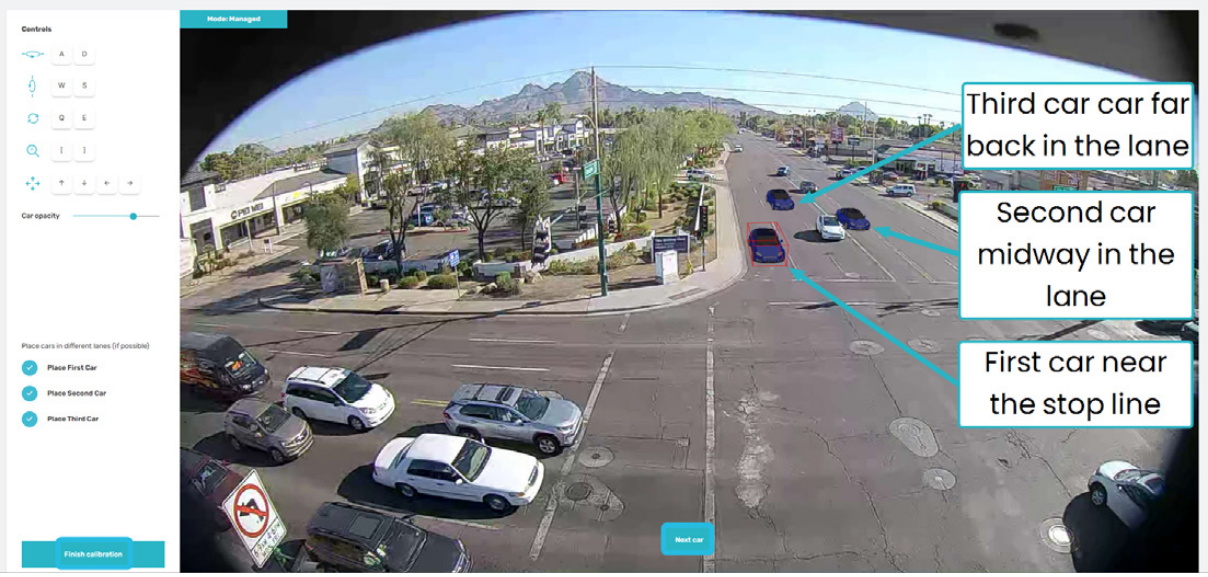
   Rotate the 3D car model:
   - Press **A** and **D** to rotate horizontally.
   - Press **W** and **S** to rotate vertically.
   - Press **Q** and **E** to adjust the tilt angle.
4. Scale the 3D Car Model to match the proportions of the adjacent visible vehicles in the screen view.

   Adjust the scale:
   - Press **[** (open square bracket) to decrease size.
   - Press **]** (close square bracket) to increase size.

Note
The 3D default car model is sized to match a Tesla Model 3.

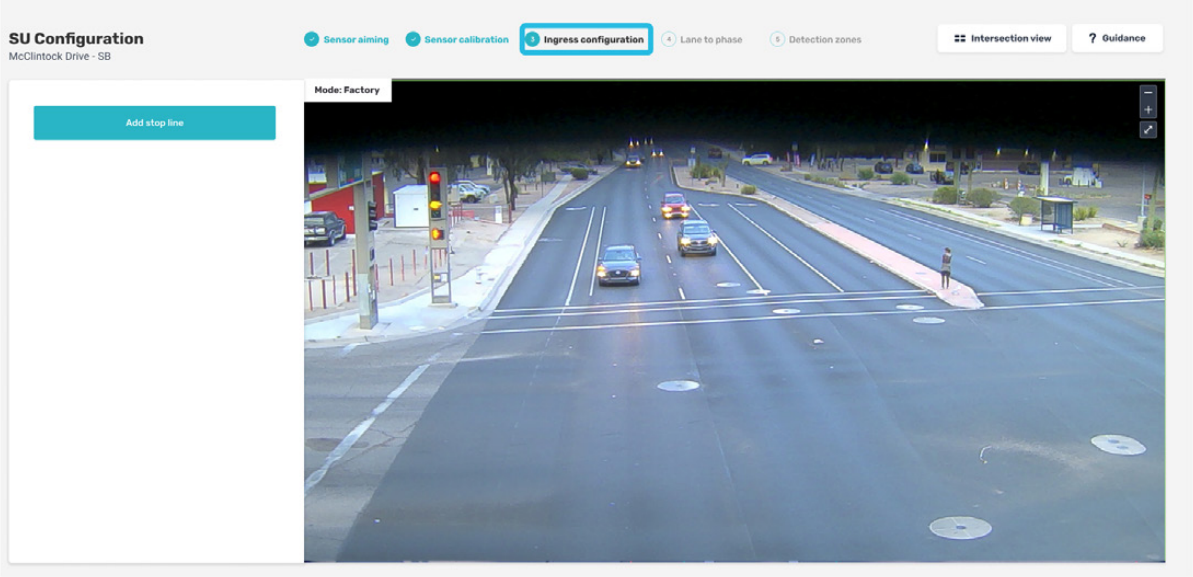
5. Modify the opacity of the 3D car model using the **Car opacity** slider.
6. When the first 3D car model is correctly placed, click **Next car** and repeat steps 1–5 for the second and third 3D car model placements.

7. Click **Finish calibration**to complete the process. The following figure describes the completed **Sensor Calibration** step.



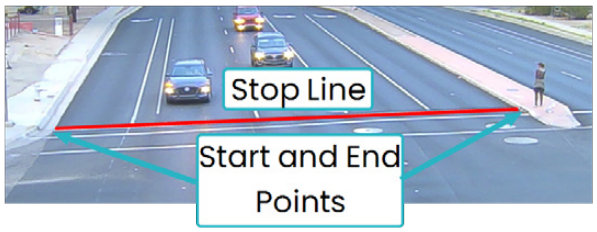
9.3 Ingress Configuration

In this step you set up the stop line and trajectories that are viewed by the Sensor. The following figure describes the **Ingress configuration** screen.



To add a stop line:

1. Click **Add stop line**.
2. Select at least 2 points on the street view that represent the start and the end of the stop line. The stop line is drawn between these points in red.
3. If the actual stop is not straight, you can select multiple points along its path to trace the shape accurately.

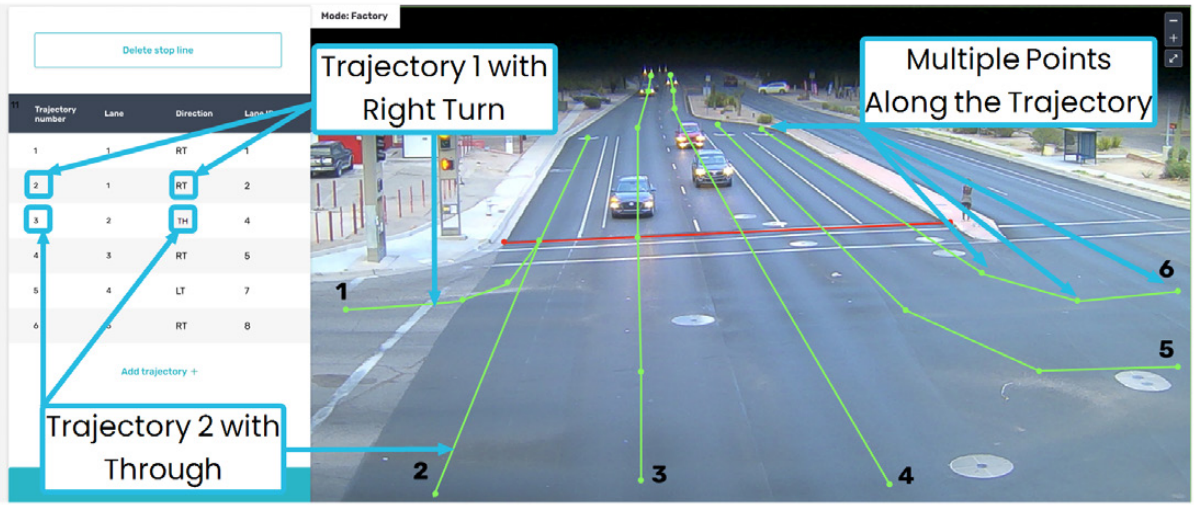


4. If the stop line is incorrect, click **Delete stop line** and repeat steps 1-3.

To add a trajectory:

In this step you draw a trajectory for every possible vehicle movement through the intersection

- A single lane can have multiple trajectories for different directions, such as right turn and straight.
- Add each trajectory one at a time, starting from one side of the view and working across.



Note

Make sure that the trajectories do not overlap, as this may interfere with subsequent lane creation steps

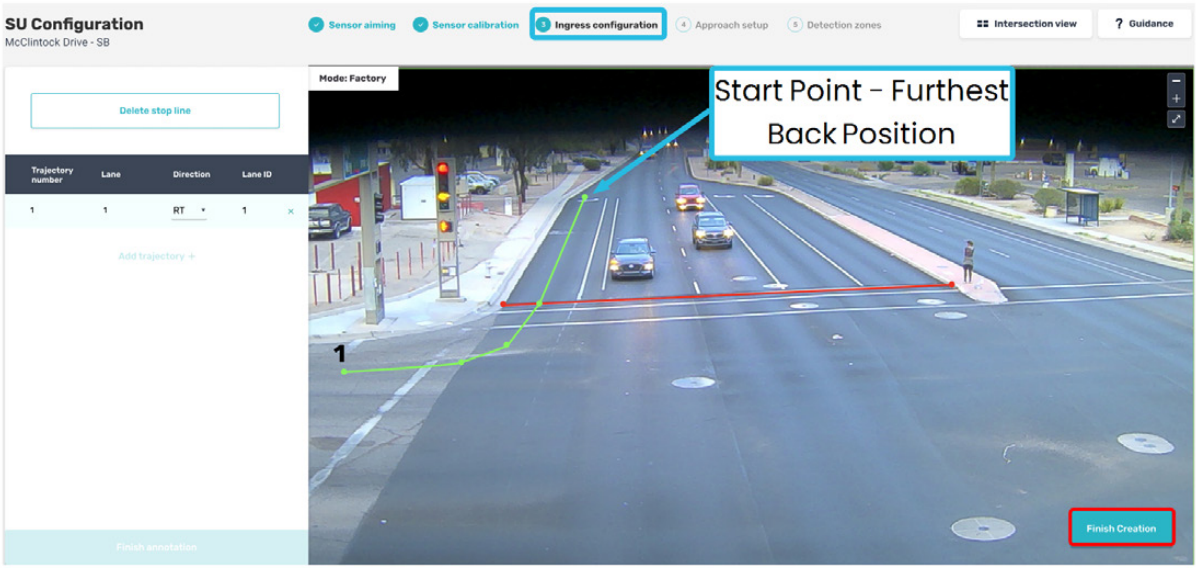
Note

Lane IDs are used for internal purposes and do not follow sequential numbering. If a lane is deleted and a new one is added, the numbering will skip, for example: 1, 2, 4.

1. Click **Add trajectory +**.
2. Select at least two points on the street view that represent the trajectory of the flow of the traffic. If the actual trajectory is not straight, select multiple points along its path to trace its shape accurately.

Note

Start the trajectory as far back as possible, near the horizon point and draw it through to the exit point. This defines the detection zone boundary limit.



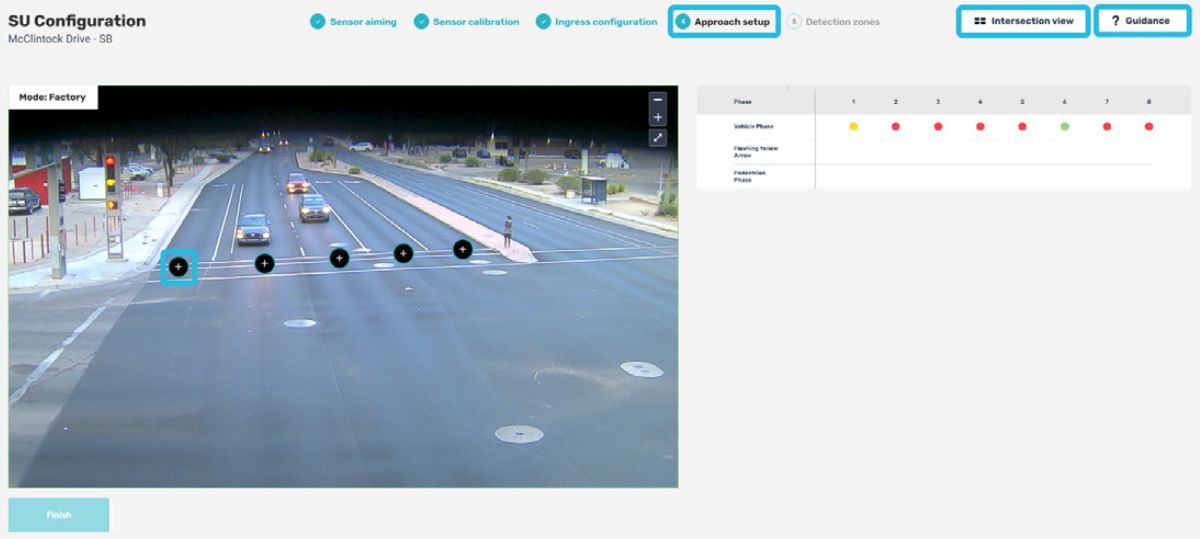
1. Select the number of the **Lane.**
2. Select the **Direction**.
3. Click **Finish Creation.**
4. Repeat steps 1 to 5 to add more trajectories.
5. Click **Finish annotation** after adding all lane trajectories.

Note
If an error occurs, follow the instructions provided in the error message.

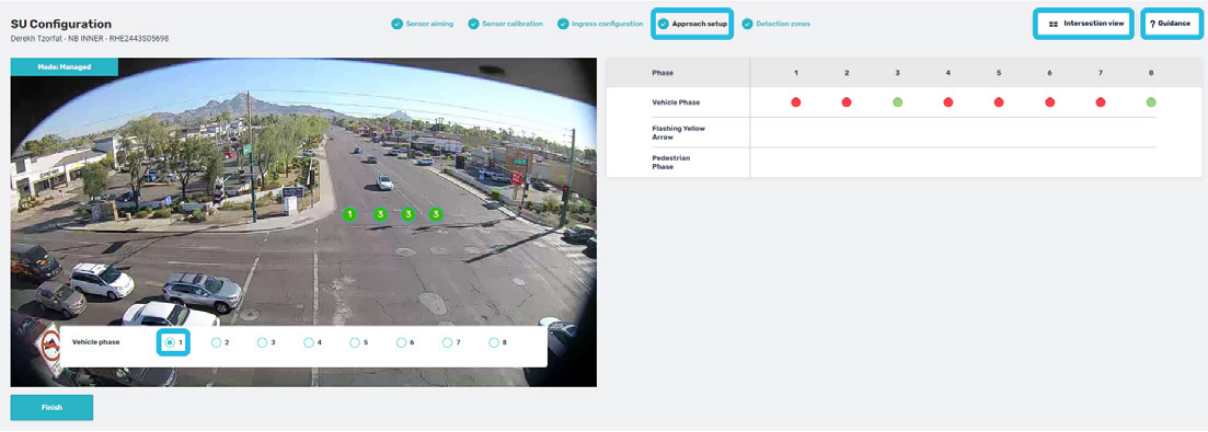
Warning
If you return to the **Ingress configuration** after completing it and make changes to the trajectories, all Sensor configurations from the previosus steps are deleted. This includes trajectories, lane-to-phase assignments, and detection zones.

9.4 Approach Setup

1. Click ⊕ to select a lane to add to a phase.

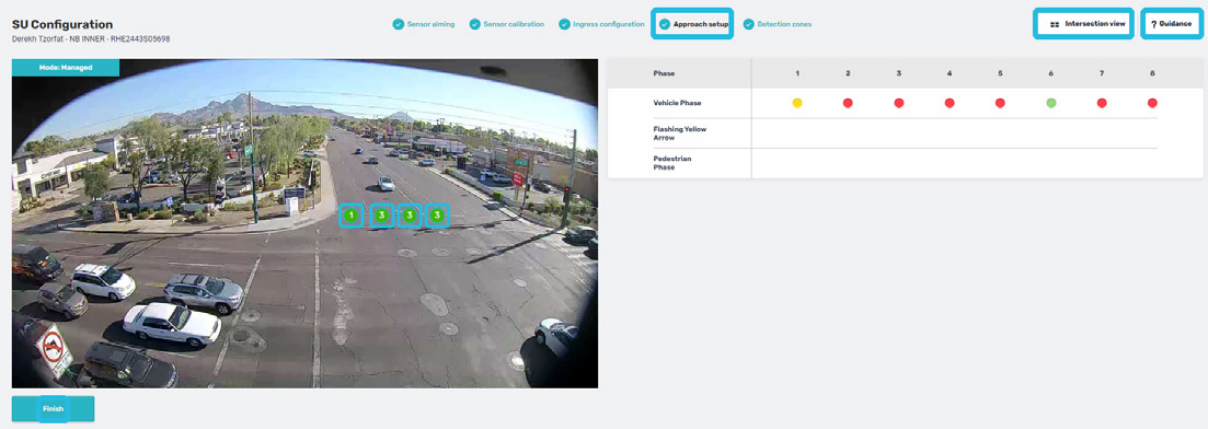


2. Select the **Vehicle phase**.



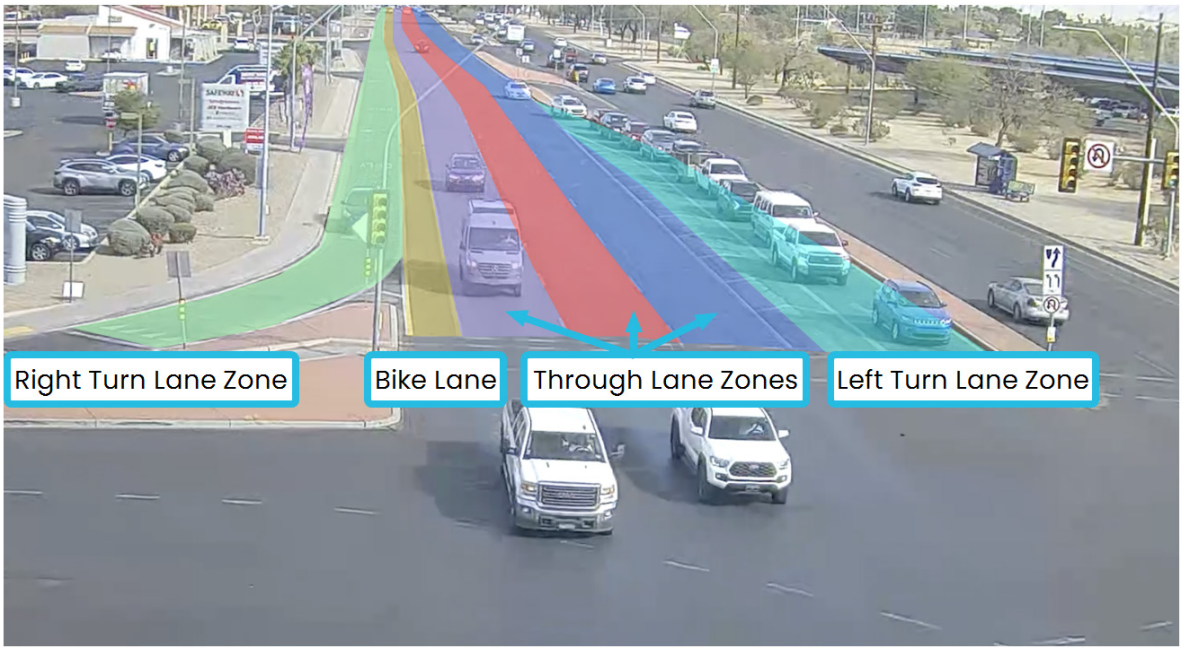
3. Repeat steps 1 to 2 to add all lane's vehicle phases.

4. Click **Finish**.



9.5 Setting up Detection Zones

The Intersection Assistant generates colored lane zones that define where to place **Detection Zones** . The following figure shows a example intersection and does not depict the same intersection as the previous image.



Before proceeding, make sure that the colored lane zones match the actual lane layout. These zones are framed by the trajectory lines you created the **Ingress Configuration** step, see Ingress Configuration. The zones extend from the farthest trajectory points on the trajectory lines to the **Stop Line**.

To adjust lane zones

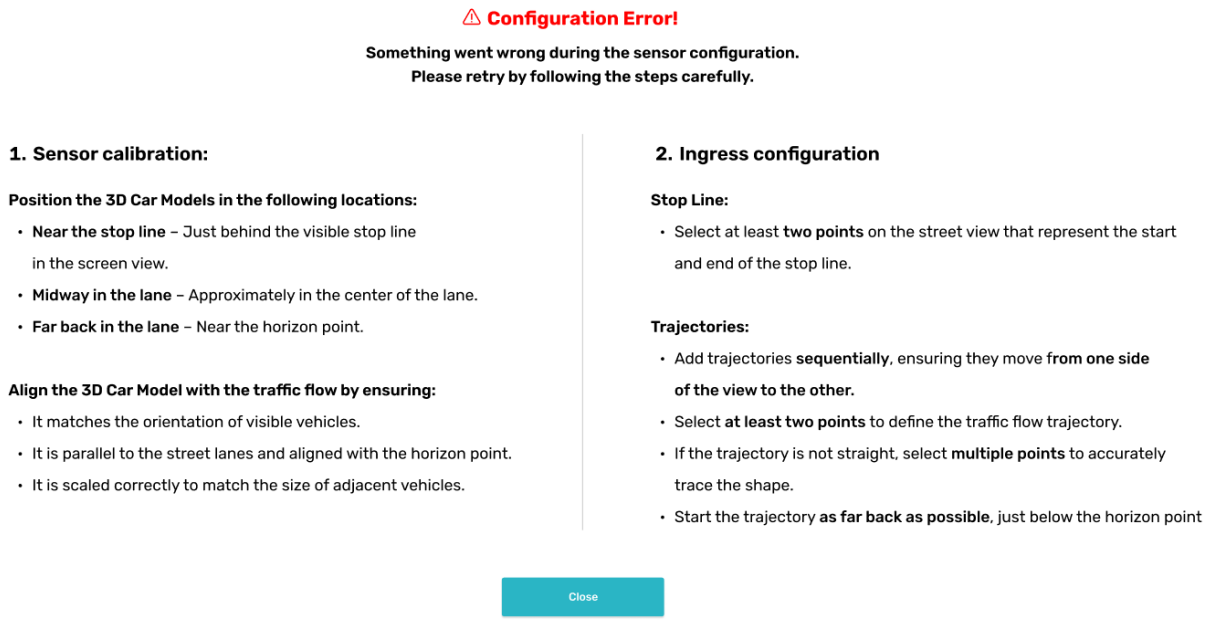
If the colored lane zones appear misaligned or do not match the physical lane layout.

1. Return to the **Ingress Configuration** step.
2. Adjust the trajectory lines to shift zone boundaries (e.g., move a zone left or right).
3. Return to this step to confirm that the colored zones now align correctly with the lanes.

To resolve a configuration error

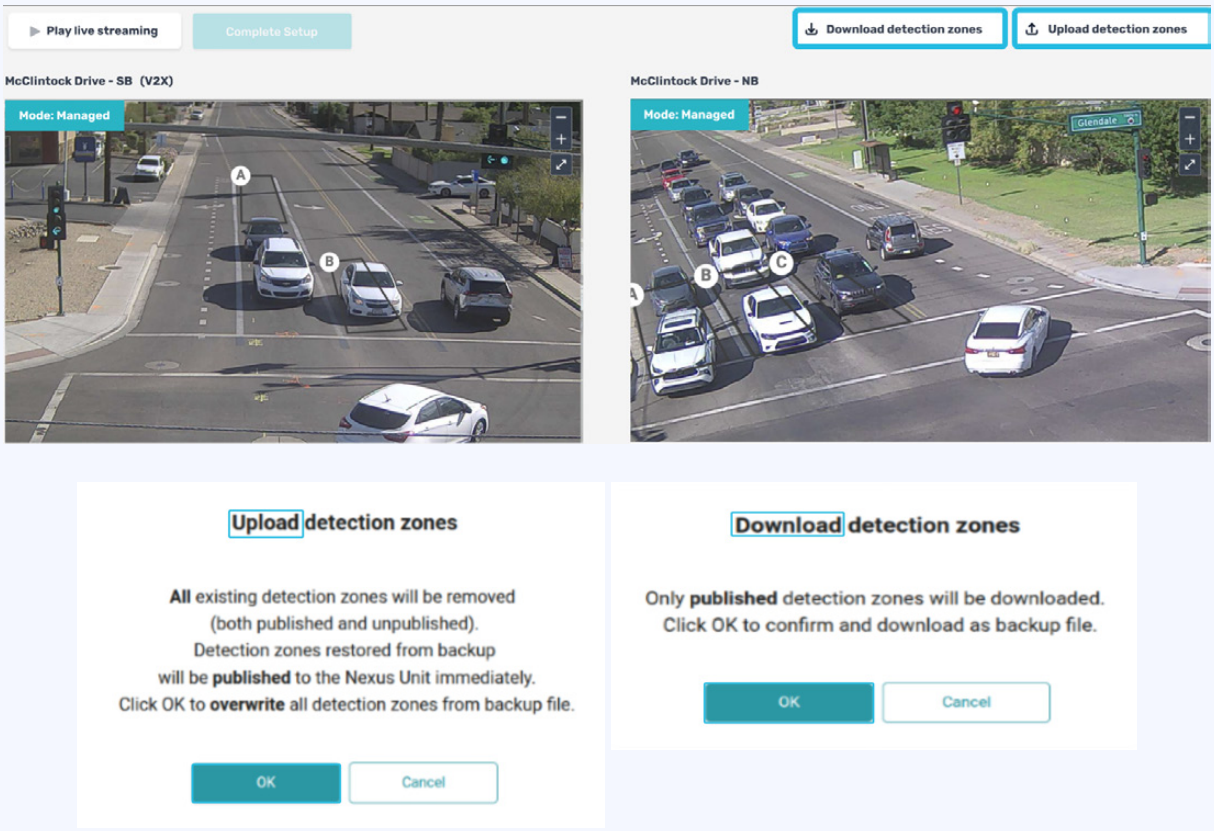
If the system detects an error, a popup message appears with guidance.

1. Follow the instructions in the following popup to fix the configuration.



Note

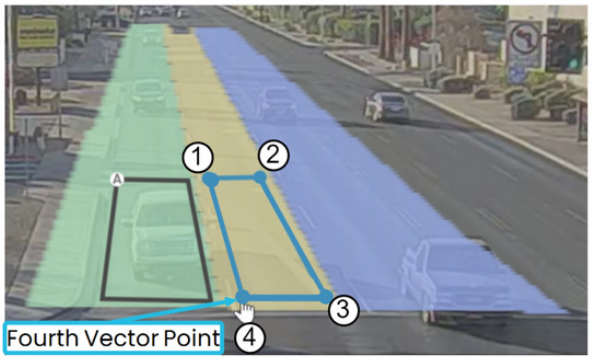
Upload previously saved detection zones or download current detection zones for future use, as shown in the following figure.



9.5.1 To Create a Detection Zone

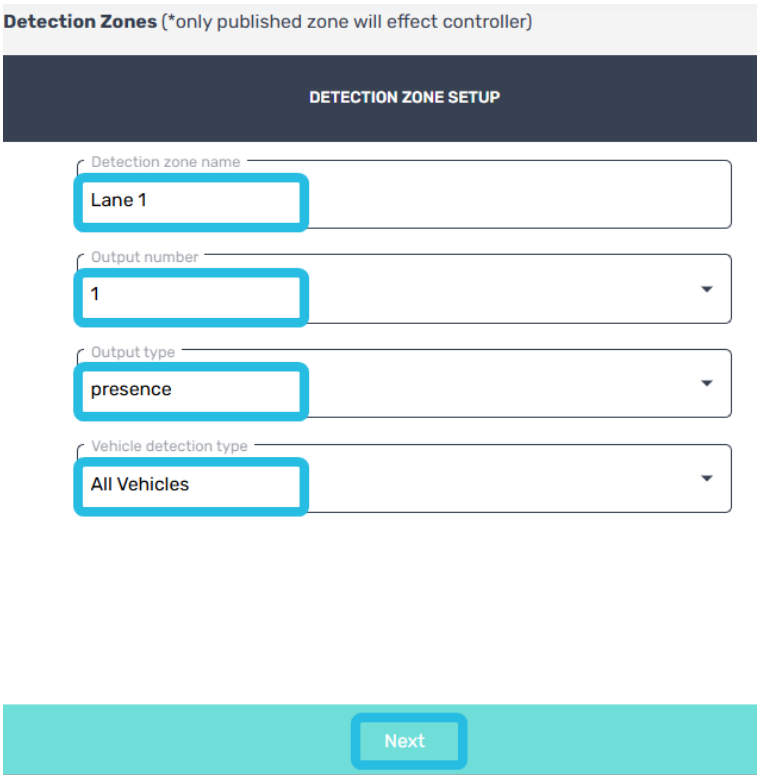
1. Click **Detection Zone.**

2. Select four vector points within the colored lane to define the detection zone. The detection zone must remain entirely inside the colored lane and will appear superimposed once created.



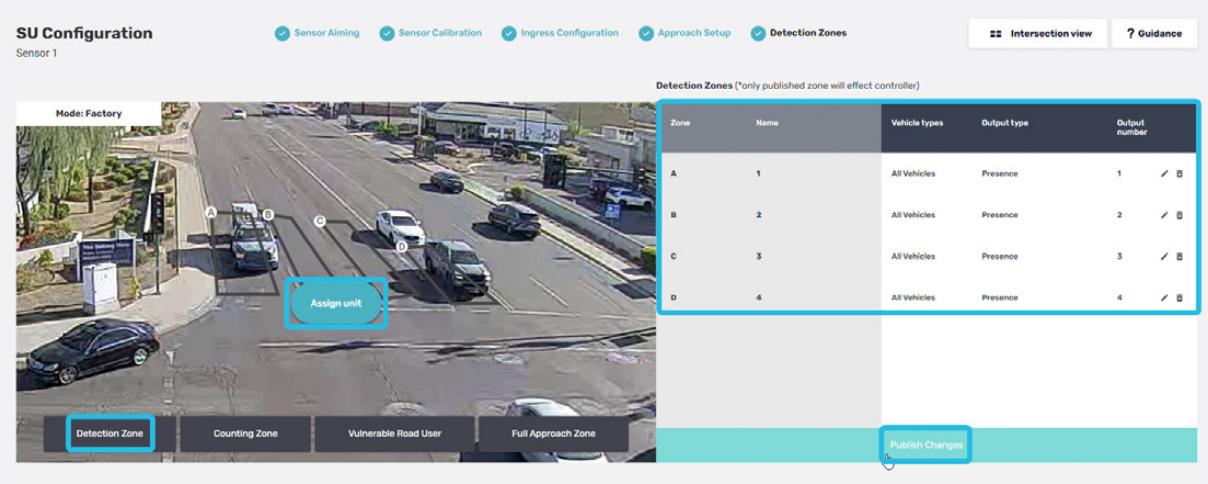
3. Fill in the required fields: After completing each field, click **Next** to proceed.

   a. Enter a descriptive name for the **Detection zone name**.
   b. Select an **Output number**.
   c. Select the **Output type**.
   d. Select the **Vehicle detection type**.



4. Confirm whether to save or discard the newly created detection zone.

5. Click **Assign unit** and repeat steps 1 to 5 to create additional detection zones.



6. Click **Publish Changes** to apply the configurations.

9.5.2 To Create Optional Detection Zones

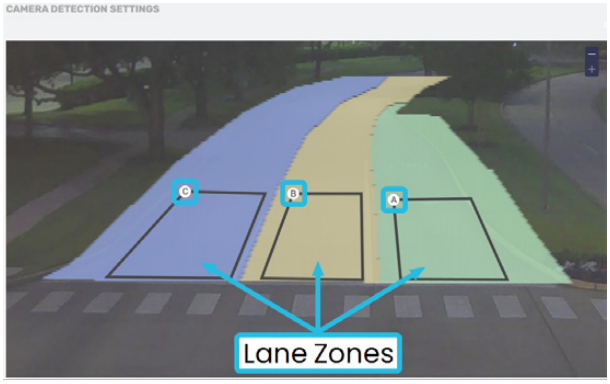
During **Detection Zone** setup,the following optional configuration features are available:

- **Counting zone** - define per lane, thay are used to send pulse signals to the the selected output port on TSC.
- **Vulnerable road user** - used to identify and prioritize protect detection for pedestrians and cyclists.

To configure a Counting zone

1. Click **Counting Zone.**

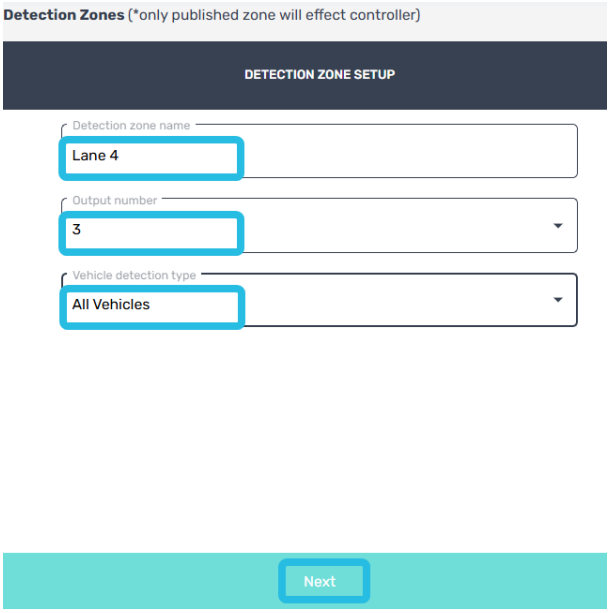
2. Left-click on the required lane.



Note
Polygons shown during Counting Zone setup are carried over from previously created Detection Zones.

- You may skip the Detection Zone step and begin directly with the Counting Zone.
- You can still select the lane (colored area) by clicking on it, even if no polygons are present.

3. Fill in the required fields. Click **Next** after completing each field:
   a. Enter a descriptive name for the **Detection zone name**.
   b. Select an **Output number**.
   c. Select the **Vehicle detection type**.



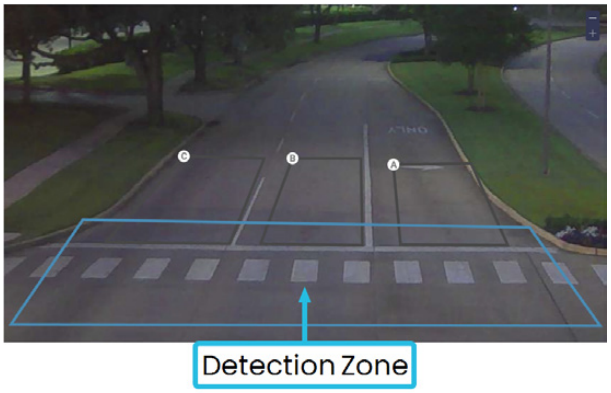
4. Confirm whether to save or discard the newly created detection zone.

To configure a Vulnerable road user (VRU) zone

Note
Pedestrian detection is an **add-on** feature that requires a separate purchase.

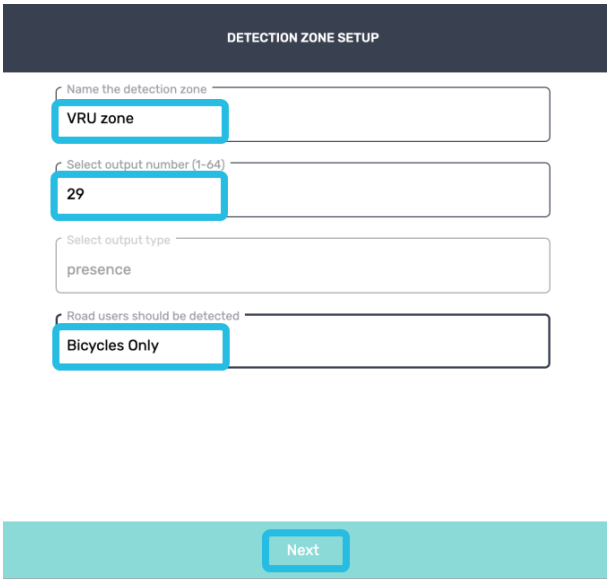
1. Click **Vulnerable road user.**

2. Select the vector points to define the detection zone. The zone will appear superimposed on the selected lane.



Note
For pedestrian protection (extension), the VRU zone should extend approximately 20 % beyond the crosswalk width, away from the stop bar.

3. Fill in the required fields. Click **Next** after completing each field:
   a. Enter a descriptive name for the **Detection zone name**.
   b. Select an **Output number**.
   c. Select the **Road user** to be detected (e.g. Bicycle, Pedestrian).



4. Confirm whether to save or discard the newly created detection zone.

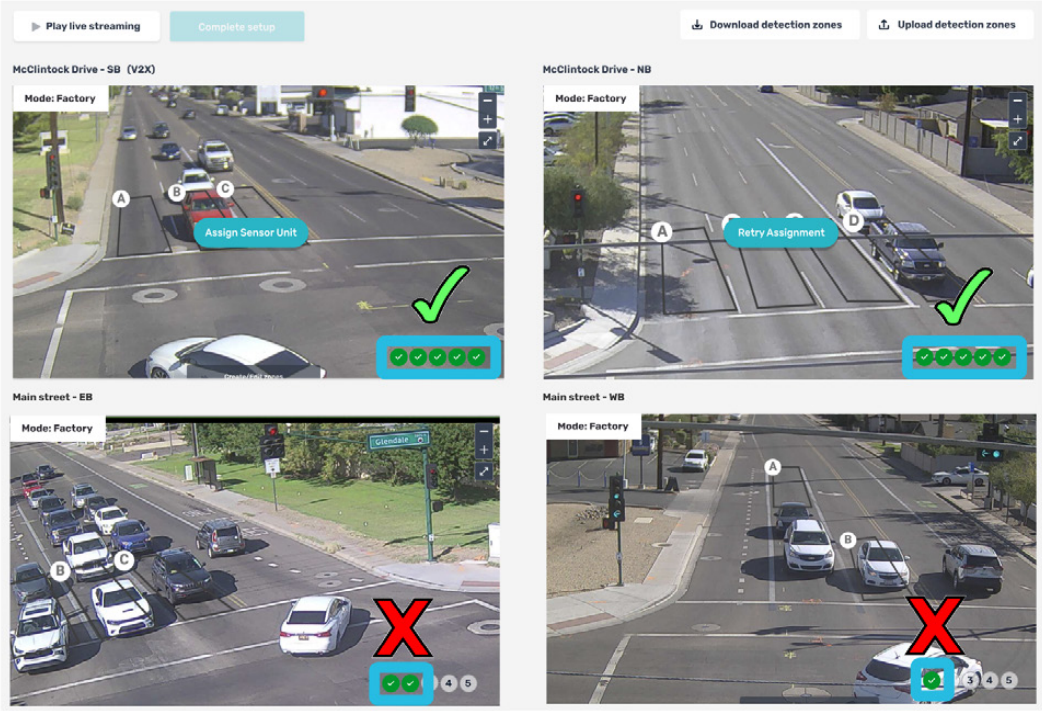
To configure Full approach zone

1. Click **Full approach zone.**

Note
The **Full approach zone** is configured **only after** the intersection enters **Managed Mode**. It is not included in the Wizard flow.

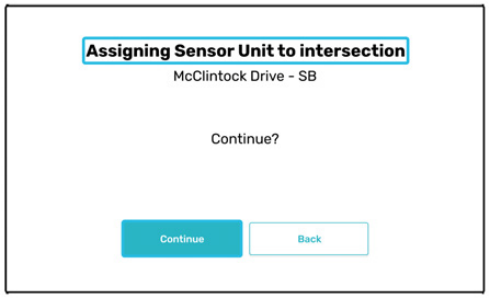
9.6 Assigning the Sensor to the Intersection

1. Navigate to the **Intersection View** for the Sensors and make sure that the status of all configuration steps is successfully completed. This is indicated by five in the lower right section of the Sensor screen view.

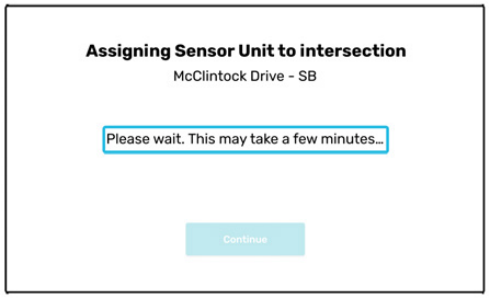


2. Click **Assign Sensor Unit**.

3. Click **Continue**.



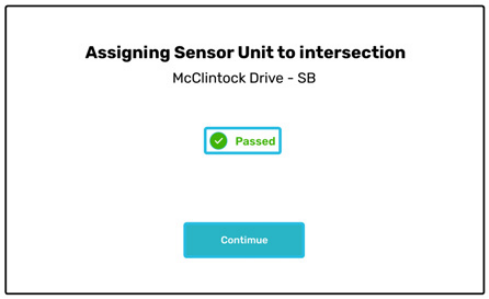
4. Wait while the unit is being assigned.



5. The following mode options result:

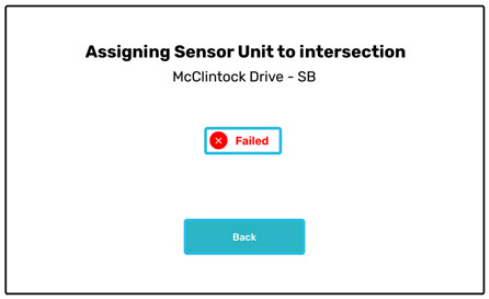
a. **Passed**.

- Click **Continue**. The IM moves the Sensor status to **Mode: Operational**.



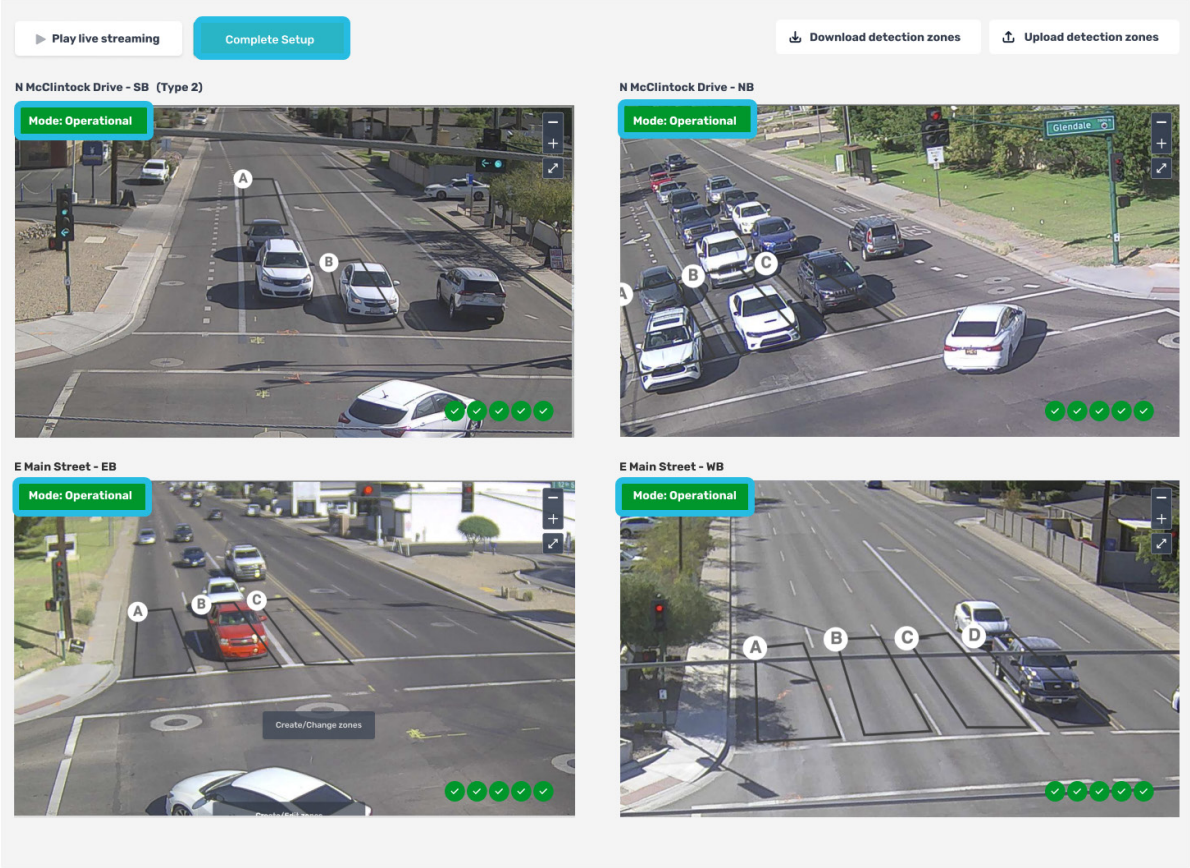
b. **Failed**.

- Click **Back**. If the problem persists, contact the NOC, see Appendix C - Regular and Diamond Intersections.



9.7 Complete Set Up of all Sensors

1. Repeat steps 9.1 to 9.6 to configure all remaining Sensors at the intersection.
2. Make sure the status of all Sensors in the intersection is Mode: Operational, click **Complete Setup**.

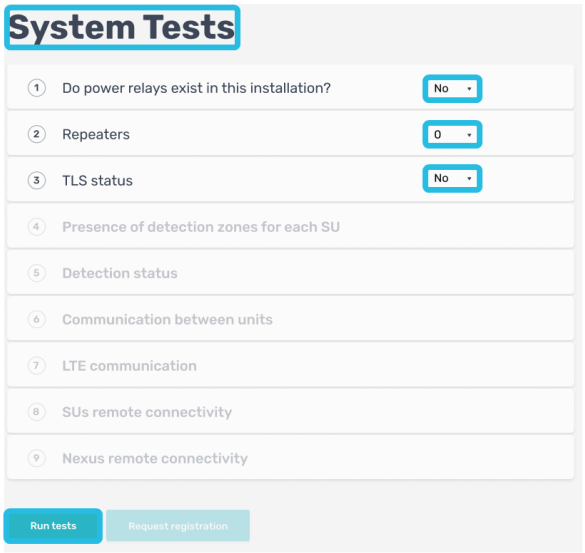


Once all Sensors are assigned and their status is **Mode: Operational**, the intersection can then be finalized and moved to operational status. This requires running final system tests and registering the intersection location.

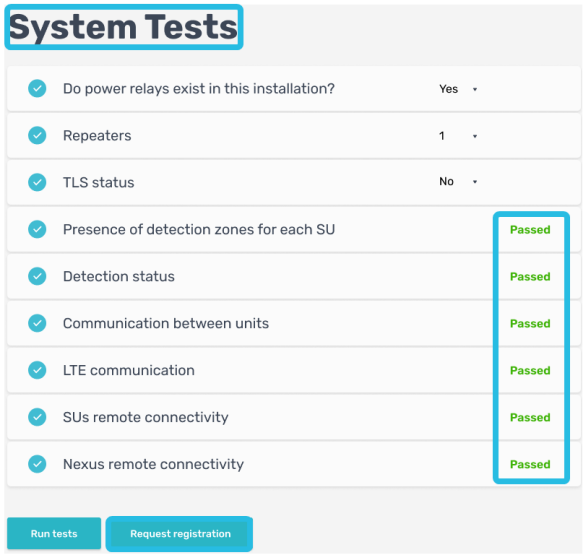
Note
You can complete the setup of the intersection even if an Sensor has failed.

10. System Tests

1. In line 1 select whether power relays are included in the installation.
2. In line 2 select the number of repeaters.
3. In line 3 confirm the TLS Status.
4. Click **Run Tests**.

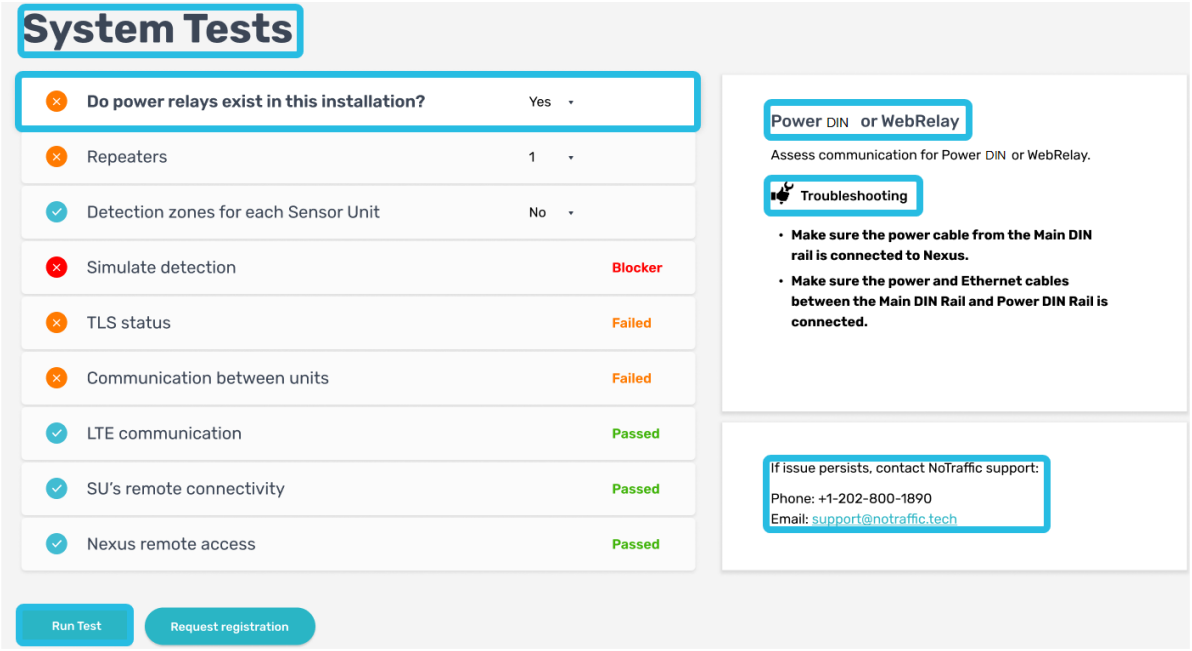


5. Once all system tests have passed, click **Request registration**.



6. If a system test fails, select the test name of the failed test.

7. Click **Run test**.

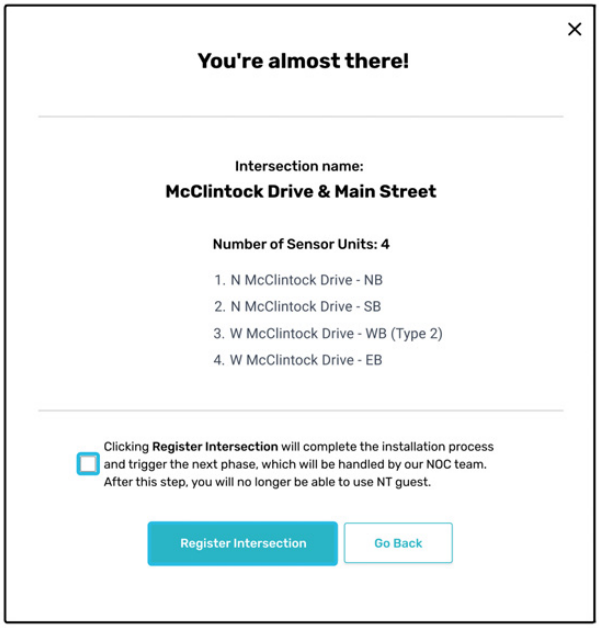


A window appears with the description of what to test along with troubleshooting recommendations. If the problem persists, contact the NOC using the details provided, see Appendix C - Regular and Diamond Intersections.

Note
You can proceed to register with the NOC even if some tests have failed.

11. Registering the Intersection

1. Select the check box to accept the conditions for registering the intersection.
2. Click Register Intersection.



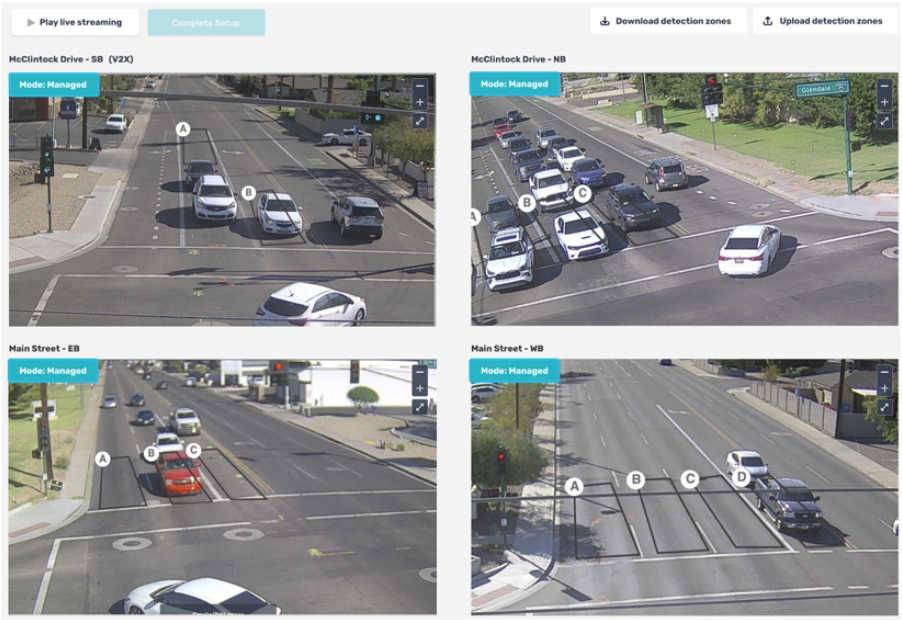
Note
If registration of the intersection failed, contact the NOC, see Appendix C - Regular and Diamond Intersections, to resolve the issue.

Note
Once an intersection is successfully registered and transitioned to Managed Mode, the NOC monitors its performance and finalizes the configuration needed for the radar to operate effectively.

3. The intersection is successfully registered.

4. You can close the laptop or click **SU Configuration** or **Detection Configuration** to verify your current communication configuration settings.

5. The intersection is reviewed by the NOC and once approved the IM status of the intersection and all Sensors change to **Mode: Managed**.



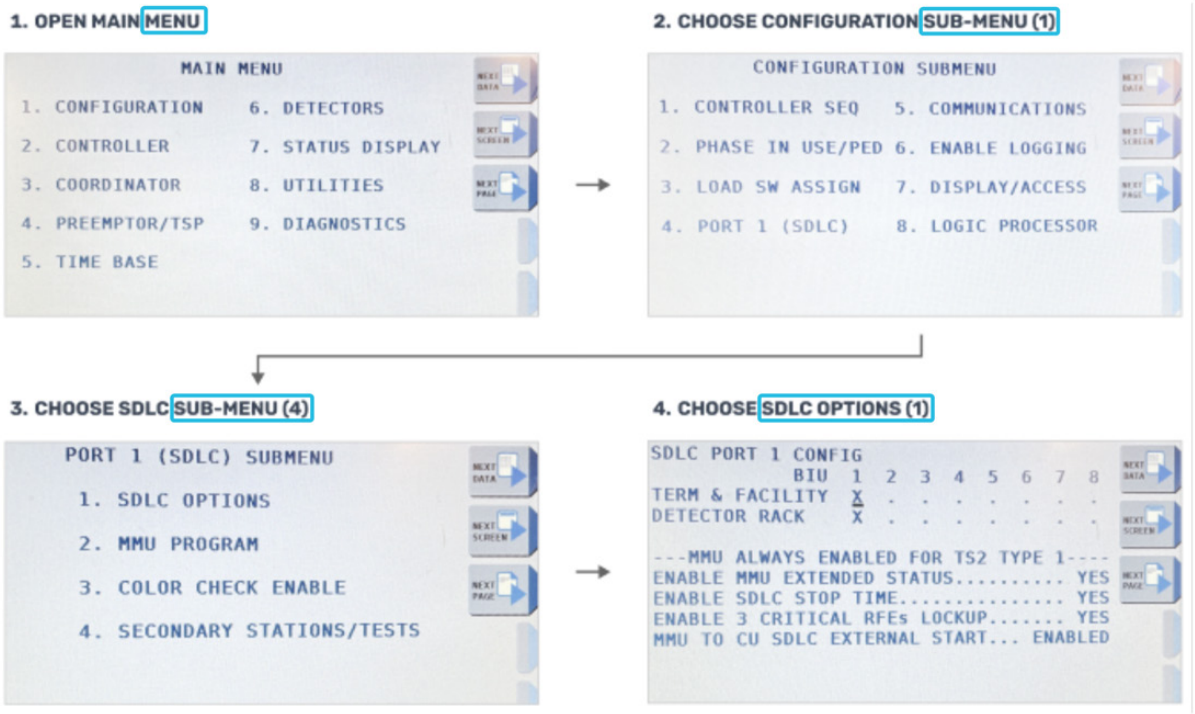
Note
Any future changes to the configuration must be coordinated with the NOC team.

12. Troubleshooting

12.1 No BIUs Available

When no BIUs are available (none are green) resolve as follows assuming at least one is gray. The following example is from the Cobalt controller; other controllers have different screens.

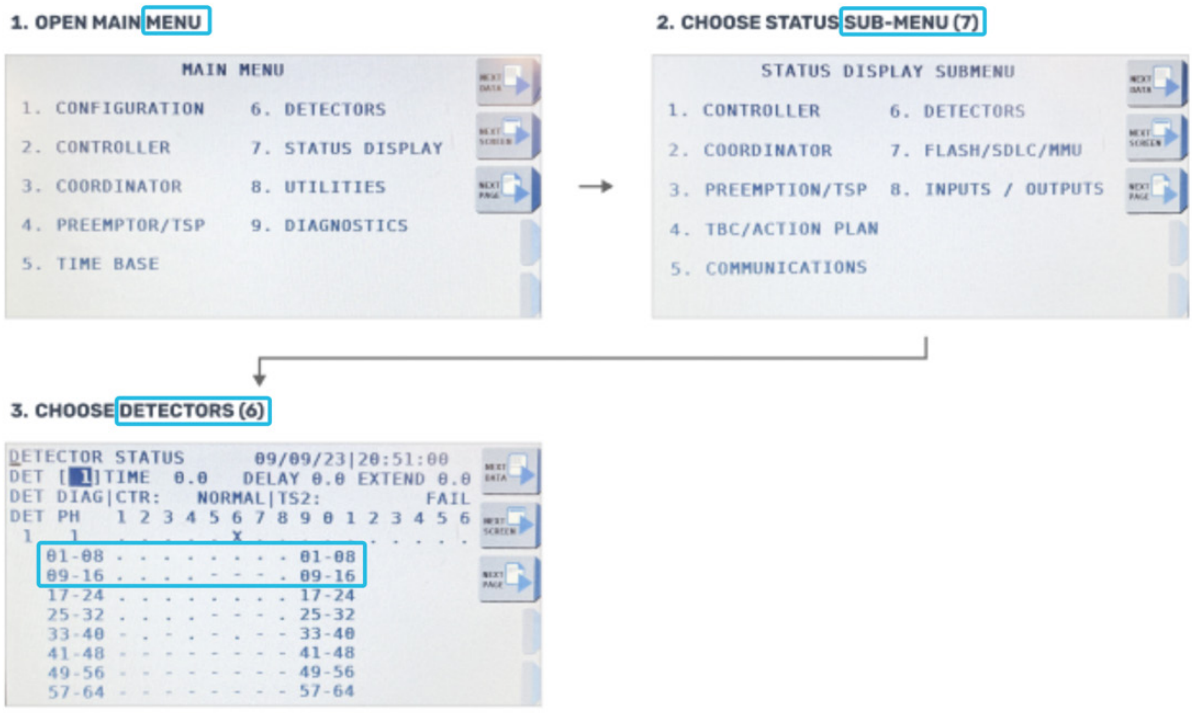
1. Open **MAIN MENU** on the controller unit.
2. Select **SUB-MENU** number 1.
3. Select **SUB-MENU** number 4.
4. Select **SDLC OPTIONS** for an available BIU as indicated by an **X** under a BIU number.



12.2 Detection Failure

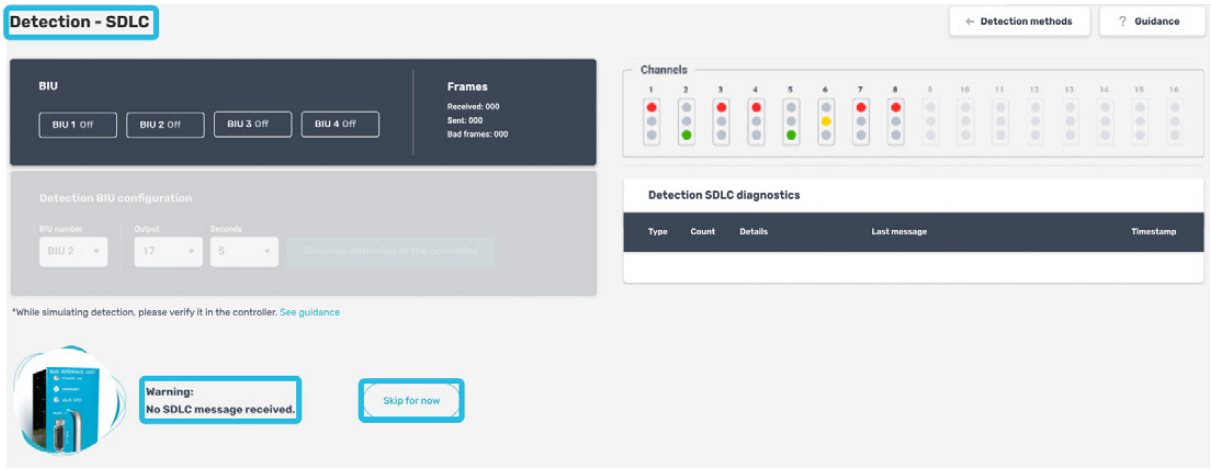
Resolve the detection failure as follows:

1. Open **MAIN MENU** on the controller unit.
2. Select **SUBMENU** number 7.
3. Select **DETECTORS** number 6.



12.3 Frame Detection Stops

If the frame counter stops or no frames are received during simulation of detection, the following error message displays:



Check the cable connection or click **Skip for now** to skip this step.

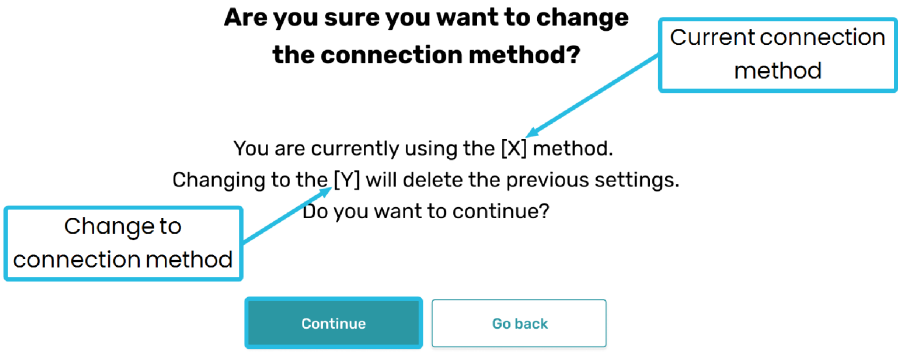
Appendix A. BIU Communication and Configuration

The BIU communicates between detectors and the master controller. It requests the status of detectors 1-16 (or up to 24 for SIU in a future release). The BIU must respond immediately, failure to do so results in the BIU entering a "fault" state. Proper configuration and enabling of a BIU are essential for accurate status reporting and avoiding bus congestion, which can arise if multiple BIUs respond simultaneously. Congestion increases the number of bad frames and in severe cases may cause the controller to switch to flash mode. The controller queries the status of all BIUs that are enabled in the controller program. Only enabled BIUs are queried.

Appendix B. Warning Messages

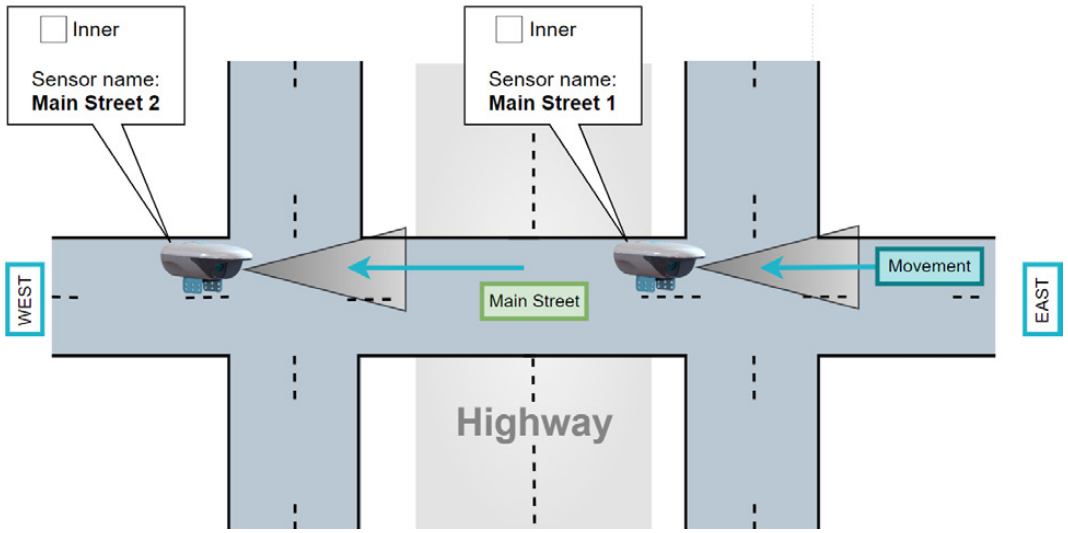
B.1 TLS Selection Warning

If another TLS connection method is set up, click **Continue** to switch to the new connection type. Alternatively click **Go Back** to cancel the setting up of the communication type selected and select a different type.

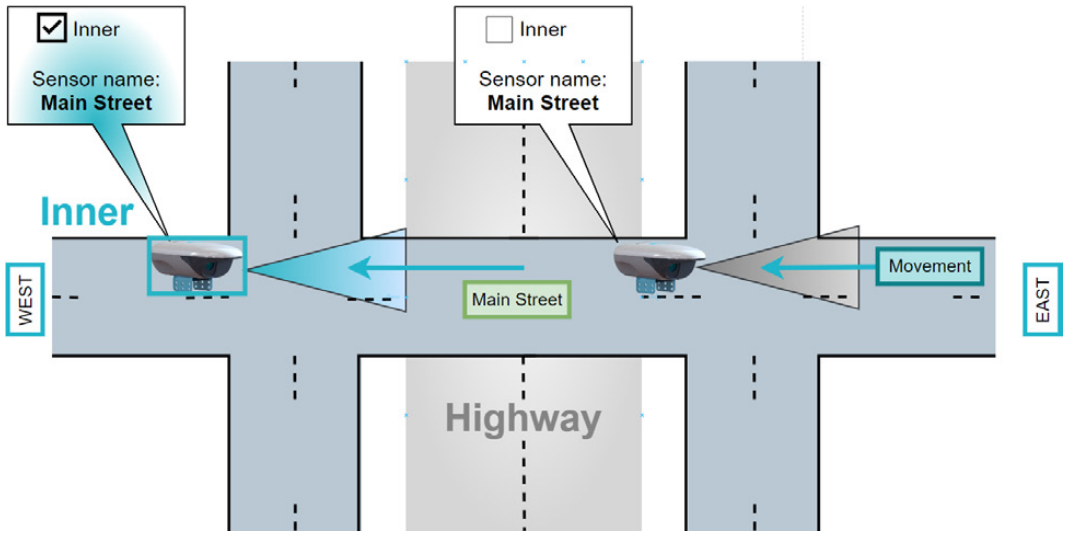


Appendix C. Regular and Diamond Intersections

- **Regular** (non-diamond) intersection
  In the following example each Sensor has a unique **Sensor name – Main Street 1** and **Main Street 2**. Neither Sensor is selected as Inner.



- **Diamond** Intersection
  In the following example each Sensor has the same **Sensor name** – **Main Street**. One is selected as **Inner** (marked blue), and the other is not.



Appendix D. Support

Technical support for troubleshooting is available 24/7/365 by phone or email. Certain restrictions and exclusions may apply.

Contact the support number 3 days in advance of aiming new Sensors or renaming existing Sensors.

Contact Support (U.S. and Canada)

- Email: support@notraffic.tech
- Toll-Free: 1-888-771-7879
- Direct: 1-202-800-1890

Appendix E. Troubleshooting

This section tables operational case scenarios and lists the steps to take to resolve each case.

Scenario	Nexus Switches From Factory To Operational Mode	Sensor Switches From Factory To Operational Mode	System Tests Status	Intersection Switches From Factory To Operational Mode
Scenario 1	✓	✓	✓	✓
Scenario 2	✗	NA	NA	NA
Scenario 3	✓	✗	✓ and/or ✗	✗
Scenario 4	✓	✓	✗	✗

E.1 Scenario 1 – Successful Process Completion

- The Nexus switches from Factory mode to Operational mode after setting up the City Network.
- The Sensors switch from Factory mode to Operational mode after successfully assigning them to the intersection.
- All system tests have run successfully.
- The intersection automatically switches to Operational mode.
- Click Register Intersection.
  - The registration request is sent to the NOC.
- The NOC moves the intersection and all units to Managed mode.

E.2 Scenario 2 – Problems

- The Nexus failed to switch from Factory to Operational mode.
- The installation is blocked.
- Retry and/or contact the NOC.

E.3 Scenario 3 – Problems

The Nexus switches from Factory mode to Operational mode after setting up the City Network.

- At least one Sensor failed to switch to Operational mode after assigning to the intersection.
- All system tests have run, regardless of success or failure.
  In this case, there are two options:
  - Contact the NOC team to attempt remote troubleshooting (accessing the intersection manager remotely).
  - Continue to register the faulty intersection (proceed to steps 4-7).

If the installer decides to continue with the registration process:

- Click **Register Intersection.** The intersection remains in Factory mode.
- The NOC team:
  - Fixes the errors in the Sensors.
  - Assigns Sensors again till successful.
  - Runs the system test.
- The intersection switches to Operational mode
- The NOC moves the intersection and all units to Managed mode.

E.4 Scenario 4 – Problems

- The Nexus switches from Factory mode to Operational mode after setting up the City Network.
- The Sensors switch from Factory mode to Operational mode after successfully assigning them to the intersection.
- The system tests failed.
  In this case, there are two options:
  - Contact the NOC team to attempt remote troubleshooting (accessing the intersection manager remotely).
  - Continue to register the faulty intersection (proceed to steps 4-7).

If the installer decides to continue with the registration process:

1. Click **Register Intersection.** The intersection remains in Factory mode.
2. The NOC team:
    - Fixes the errors in the System tests.
    - Runs the system test until successful.
3. The intersection switches to Operational mode
4. The NOC moves the intersection and all units to Managed mode.