

Formulas

Last Modified on 10/10/2024 10:43 am EDT

Adding Formulas to an Object Type

Overview

A Formula uses numeric and variable values (e.g., [select lists](#), [numeric](#) or [date](#) fields, or [workflow states](#)) to generate Incident Severity, Estimated Damage, or Incident Likelihood. Formulas are added to an Object Type through a [Relationship](#) or [Reference](#).

A formula appears on a form as a number, label (e.g., Low, Medium, High), numbers and labels, gauge, or as a formula card.

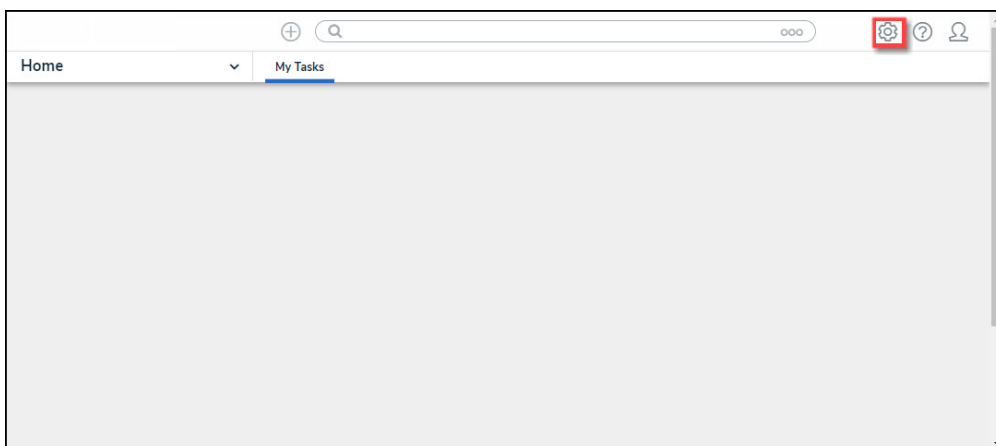
Related Information/Setup

For more information on formulas, see the following articles:

- [Formulas Overview](#)
- [Variables, Operators & Functions](#)
- [Time Functions](#)
- [Null Values in Formulas](#)
- [Formula Examples](#)
- [Formulas on Forms](#)

Navigation

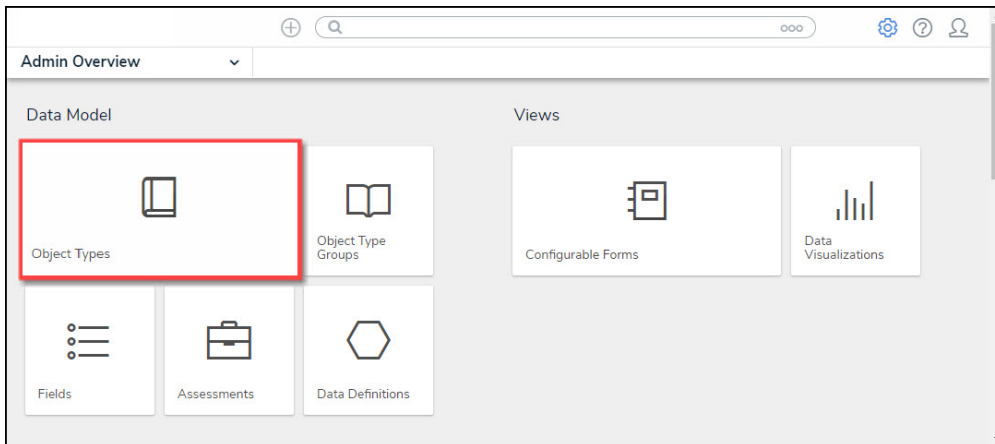
1. From the **Home** screen, click the **Administration** icon.



Administration Icon

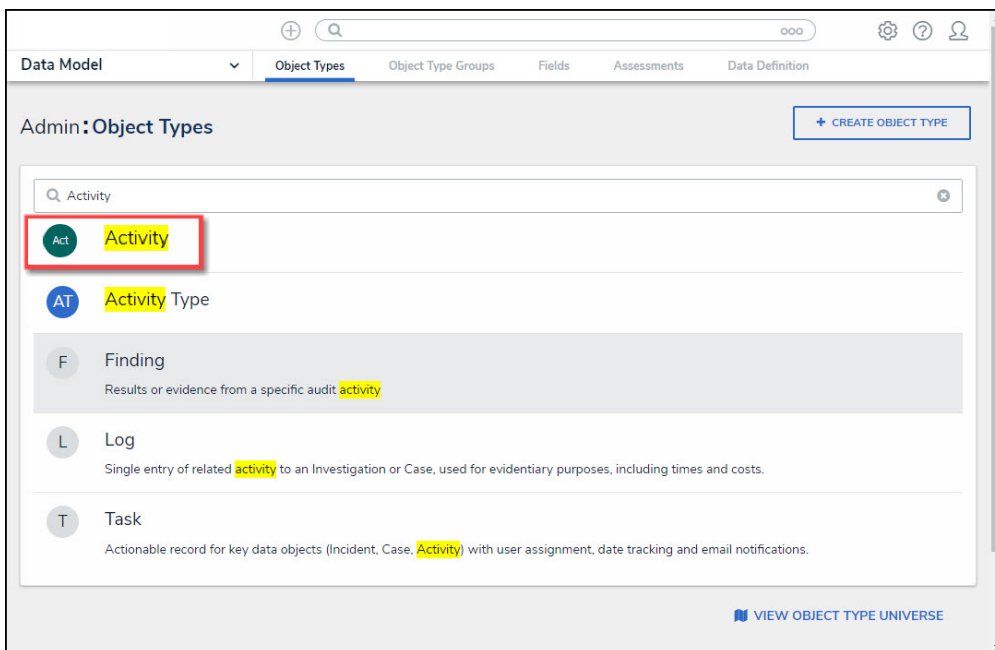
2. From the **Admin Overview** screen, click the **Object Types** tile on the **Data Models**

section.



Object Types Tile

3. From the **Object Types** screen, enter an **Object Type Name** in the **Search** field to narrow down the Object Types list.
4. Click the **Object Type's Name** you want to edit.



Click the Object Type's Name

5. From the **Edit Object Type** screen, scroll down and select the **Formulas** tab.

The screenshot shows the 'Admin: Edit Object Type' interface for 'Activity Type'. The top navigation bar includes 'Data Model', 'Object Types', 'Object Type Groups', 'Fields', 'Assessments', and 'Data Definition'. The main content area is divided into several sections: 'Activity Type' with a blue circular icon containing 'AT'; 'Workflow' with a 'CONFIGURE WORKFLOW' button; 'Concatenations' with 'CONFIGURE NAME CONCATENATION' and 'CONFIGURE DESCRIPTION CONCATENATION' buttons, and a sample formula: {{{ABBREV}}} - {{{CAT}}} {{{SCAT}}} {{{DET}}}. Below these is a tabbed interface with 'Overview', 'Fields (5)', 'Formulas (10)', 'Relationships (1)', 'References (1)', and 'Roles (0)'. The 'Formulas (10)' tab is highlighted with a red box. Underneath, there is a summary and a list of 'Related Forms': 'Activity Type - CC - Create', 'Activity Type - CC - Edit', and 'Activity Type - IRM - Library', each with a 'Priority: none' label. At the bottom right, there are 'DELETE' and 'DONE' buttons.

Formulas Tab

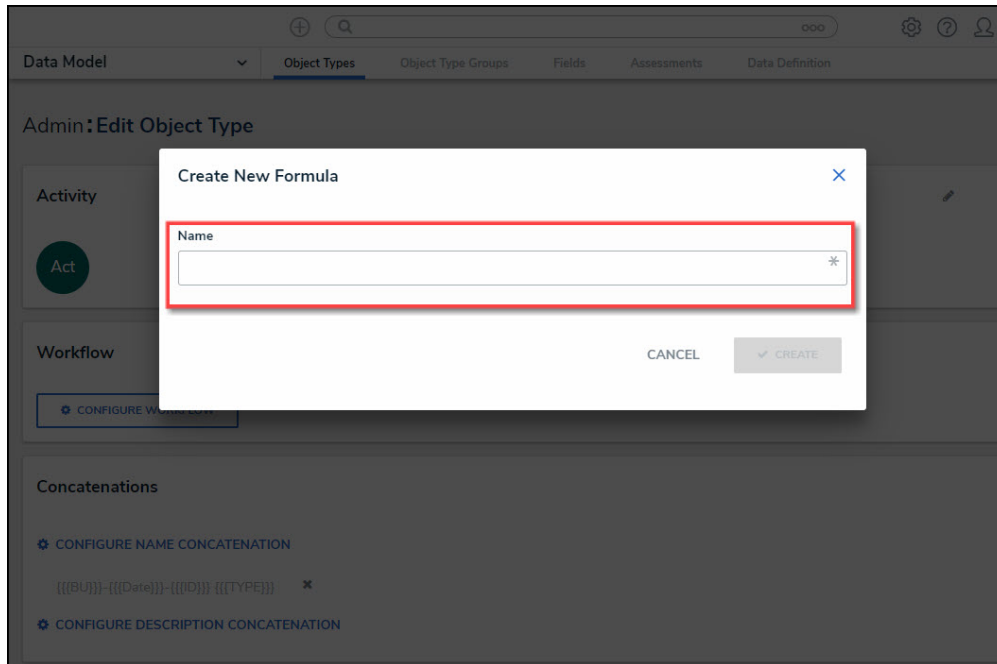
6. From the **Formulas** tab, click on the **+ Add Formula** button.

The screenshot shows the Resolver Admin interface for editing an object type named 'Activity'. The top navigation bar includes 'Data Model', 'Object Types', 'Object Type Groups', 'Fields', 'Assessments', and 'Data Definition'. The main content area is titled 'Admin: Edit Object Type' and contains sections for 'Activity' (with a green 'Act' icon), 'Workflow' (with a 'CONFIGURE WORKFLOW' button), and 'Concatenations' (with 'CONFIGURE NAME CONCATENATION' and 'CONFIGURE DESCRIPTION CONCATENATION' buttons). Below these is a tabbed interface with 'Overview', 'Fields (18)', 'Formulas (9)', 'Relationships (16)', 'References (1)', and 'Roles (1)'. The 'Formulas (9)' tab is active, showing a list of formulas with their names and descriptions. A red box highlights the '+ ADD FORMULA' button in the top right corner of the formulas list. At the bottom right, there are 'ADD' and 'DONE' buttons.

Add Formula Button

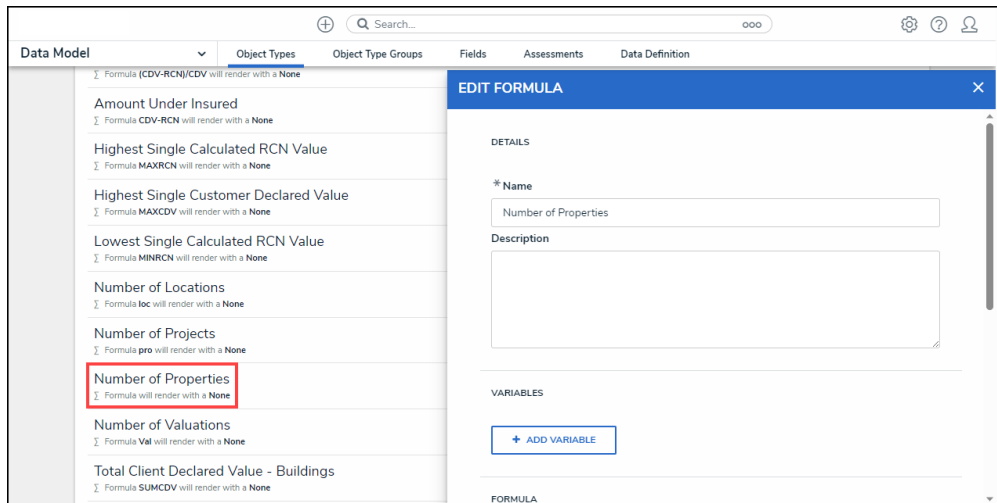
Adding a Formula to an Object Type

1. From the **Create New Formula** screen, enter a formula name in the **Name** field (e.g., Estimated Vehicle Damage).



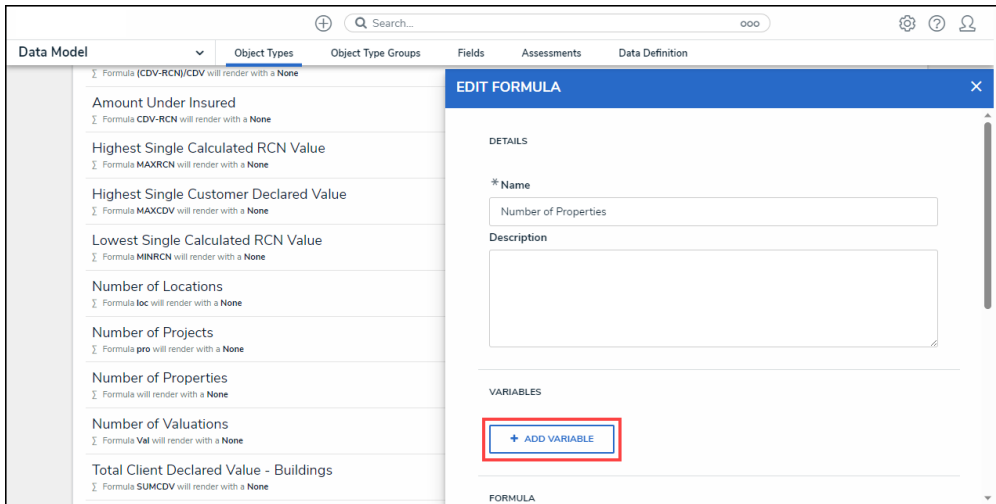
Name Field

2. Click the **Create** button.
3. The **Formulas** tab will appear, listing the newly created formula.
4. Click the new formula to open the **Edit Formula** pop-up.



Edit Formula Pop-up

5. **(Optional)** Enter a description documenting the Formulas internal use in the **Description** field.
6. From the **Variables** section, Click the **+ Add Variable** button.



+ Add Variable Button

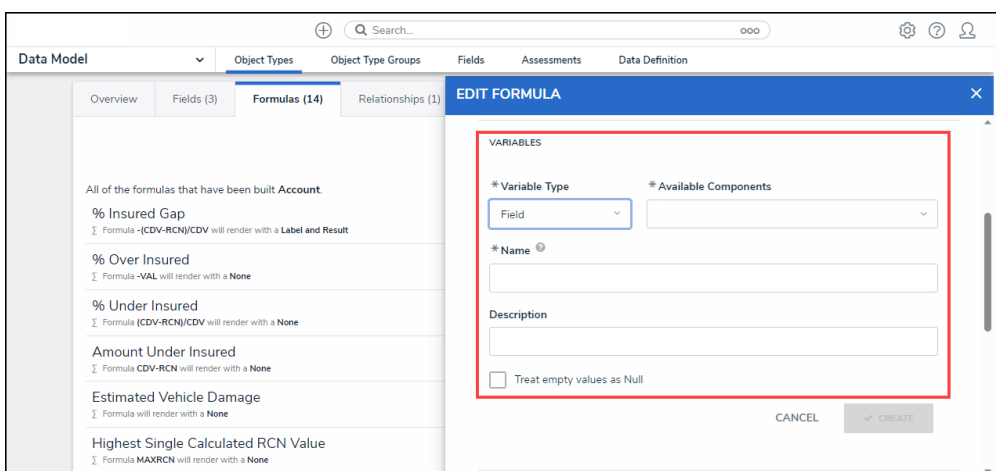
7. From the **Variables** section, select a **Variable Type** from the drop-down list. A **Variable** is a value in which the formula calculations are performed.

- **Field:** After selecting the **Field** variable, the following field will appear:
 - **Available Components:** Select a field or formula from the **Available Components** drop-down field adding it directly to the Object Type.



Note:

Fields can be added to formulas after they are added to an Object Type or if they are associated through a relationship or reference. Only numeric fields, date fields, and select lists with numeric values are accepted. For more information, see the [Fields](#) article.

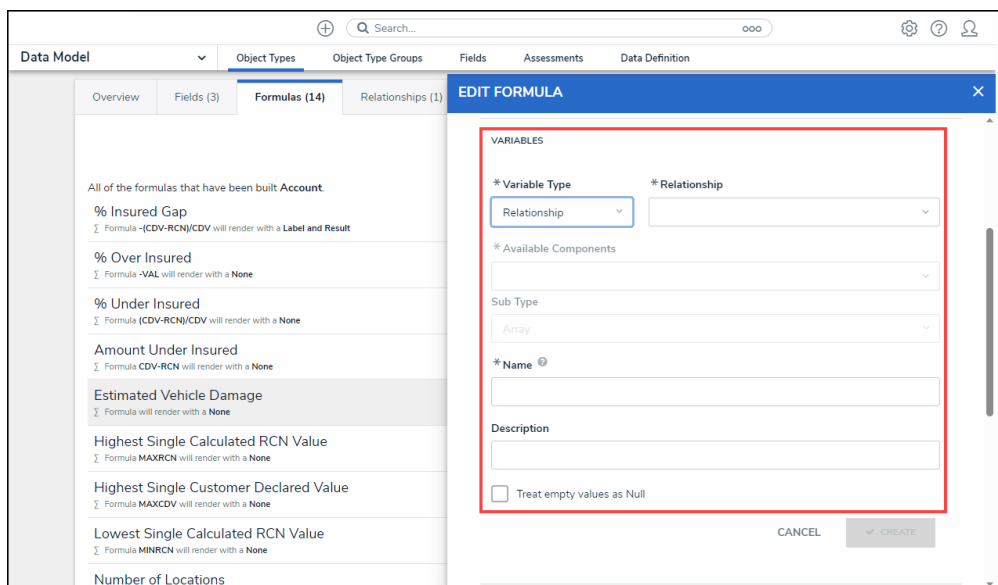


Variable Type = Field

- **Relationship:** After selecting the **Relationship** variable, the following fields will appear:
 - **Relationship:** Select the Object Type **Relationship** from the drop-down list.

Relationships connect two or more objects. The user must add a Relationship to an Object Type to appear on the Relationship drop-down list. See the [Add Relationships to an Object Type](#) article for further information on adding a Relationship to an Object Type.

- **Available Components:** Select a field or formula from the **Available Components** drop-down field adding it directly to the Object Type.
- **Sub Type:** Select a **Sub Type** from the drop-down list. Subtypes specify how the data from multiple objects are compiled, calculated, and displayed. For more information on Subtypes, see the Sub Type Table in the [Variables, Operations, & Functions](#) article.
 - **Array:** Creates a set of values from the variable.
 - **Sum:** Calculates a total from the variable's set of values and returns a single number. Select list variables cannot use Sum Sub Types.
 - **Count:** The number of times a variable has been added to an object.
 - **Average:** Calculates an average number from the variable's set of values. Select list variables cannot use Average Sub Types.
 - **Every:** Checks if the variable contains a value on the objects in the relationship/reference.
 - **Min:** Calculates the lowest number from the variable's set of values. Select list variables cannot use Min Sub Types.
 - **Max:** Calculates the highest number from the variable's set of values. Select list variables cannot use Max Sub Types.

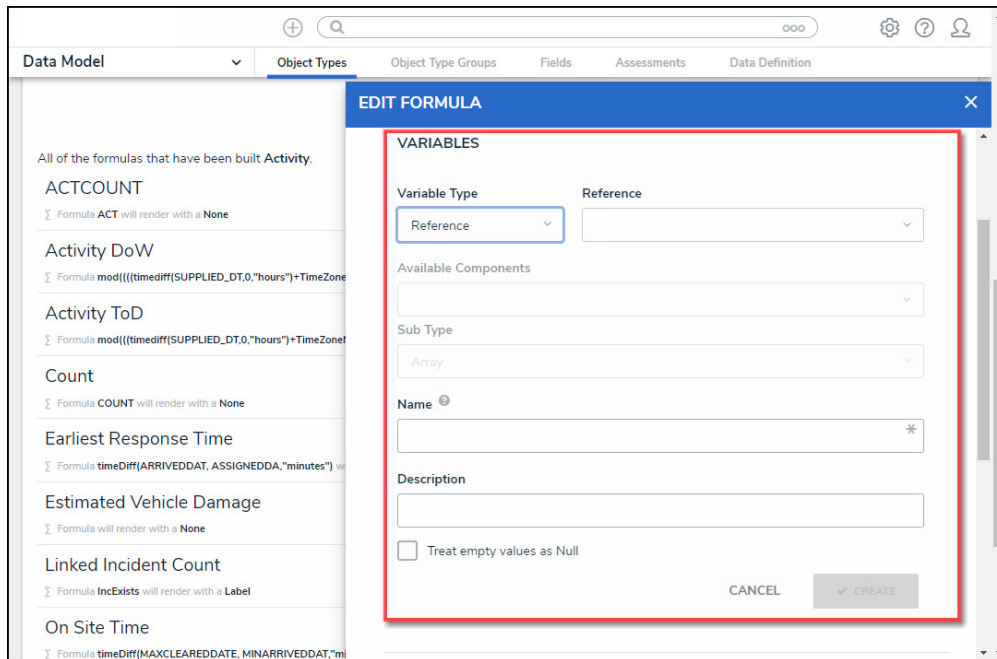


Variable Type = Relationship

- **Reference:** After selecting the **Reference** variable, the following fields will appear:
 - **Reference:** Select the Object Type **Reference** from the drop-down list.

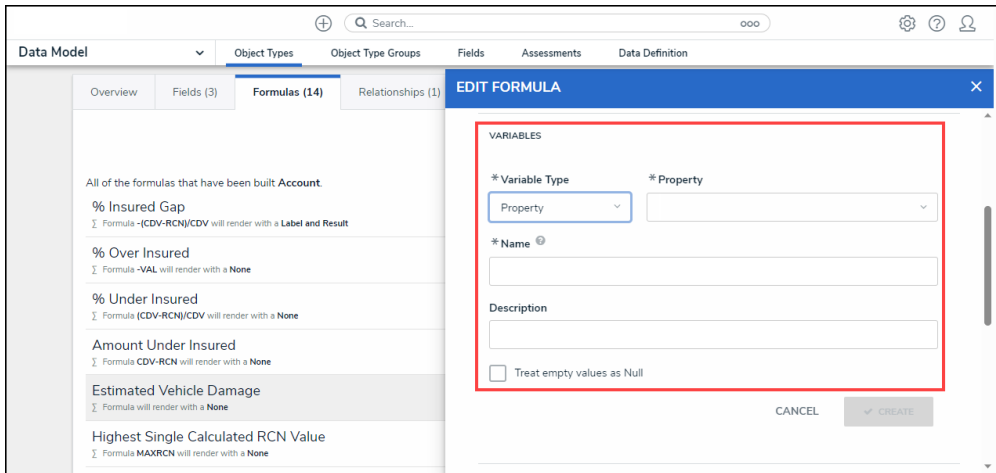
References indicate that an object is connected to another object through a relationship. References are automatically created when a relationship is created. For further information on adding a Relationship to an Object Type, see the [Add References to an Object Type](#) article.

- **Available Components:** Select a field or formula from the **Available Components** drop-down field adding it directly to the Object Type.
- **Sub Type:** Select a **Sub Type** from the drop-down list. Subtypes specify how the data from multiple objects are compiled, calculated, and displayed.



Variable Type = Reference

- **Property:** After selecting the **Property** variable, the following field will appear:
 - **Property:** Select a **Property** type from the drop-down list:
 - **Is Submitter Confidential:** This property type creates a formula that compares the number of confidential submissions against the number of not confidential submissions for customers that use the **Confidential Reporting Portal**.



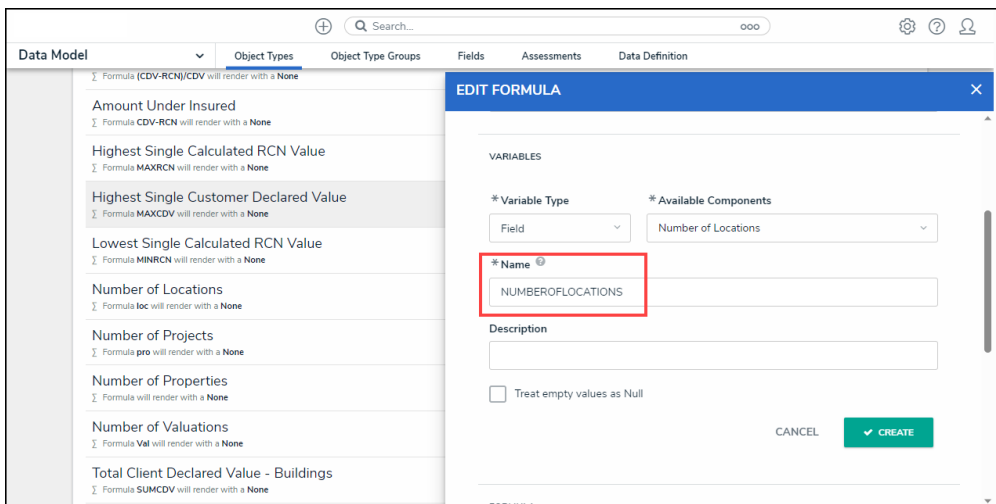
Variable Type = Property

8. The system will automatically populate the **Name** field with the field or formula's unique ID by default.
9. **(Optional)** Enter a Variable name in the **Name** field.



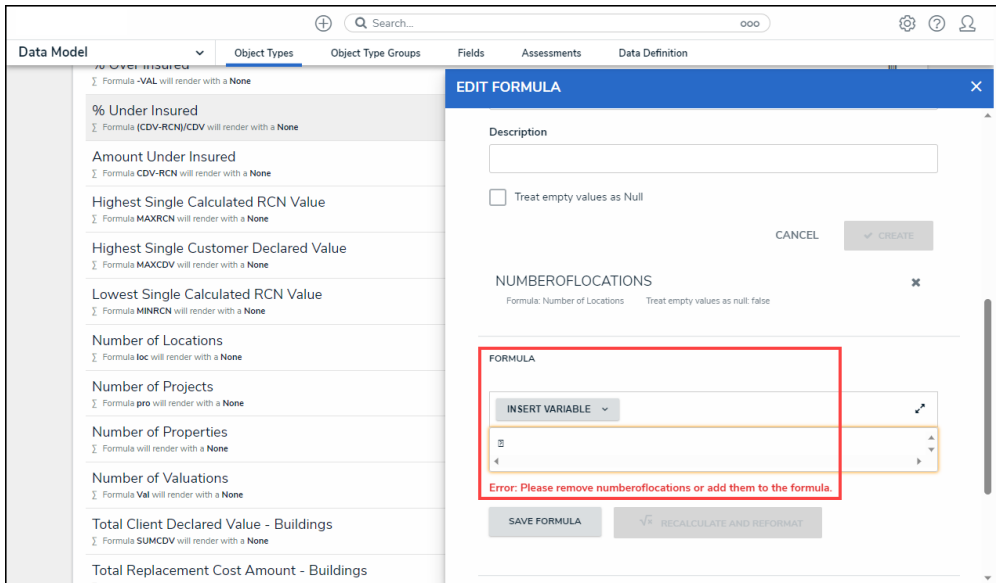
Warning:

Using a function name (Sub Type Name) in the name field will cause an error.



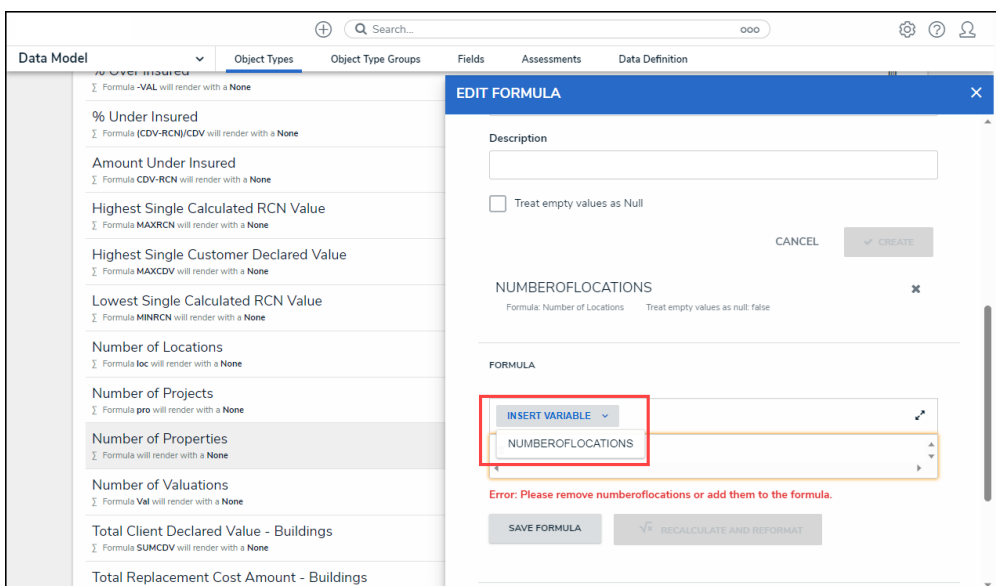
Variable Name

10. **(Optional)** Enter a Variable description in the **Description** field.
11. **(Optional)** Select the **Treat empty values as Null** checkbox to exclude blank objects from a formula calculation. For more information, see the [Null Values in Formulas](#) article.
12. Click the **Create** button to add the variable. The system will perform the Syntax Validation function, and an error message will appear under the **Formula** field, reminding the user to add the variable name to the **Formula** field.



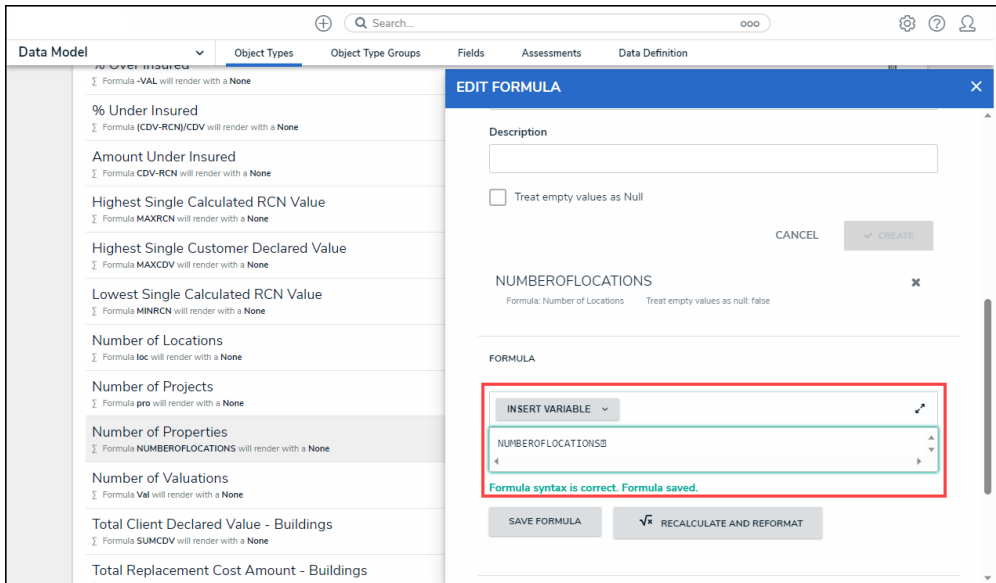
Variable Error Message

13. Click the **Insert Variable** button and select a Variable from the dropdown menu. The selected Variable will be added to the Formula field.



Insert Variable Button

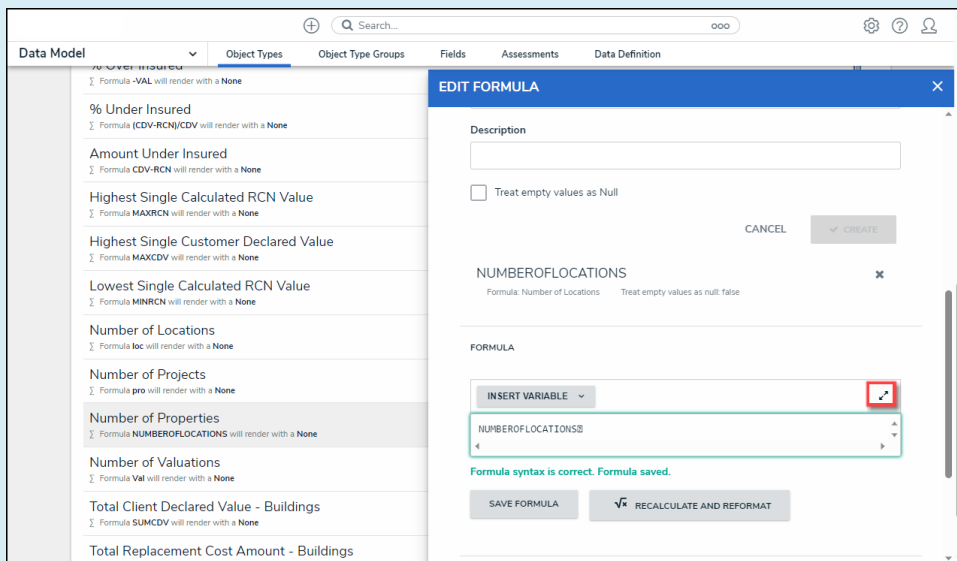
14. Click the **Save Formula** button. The **Formula** field will indicate if the Formula syntax is correct. If the Formula syntax is correct the Formula will be saved.



Formula Syntax

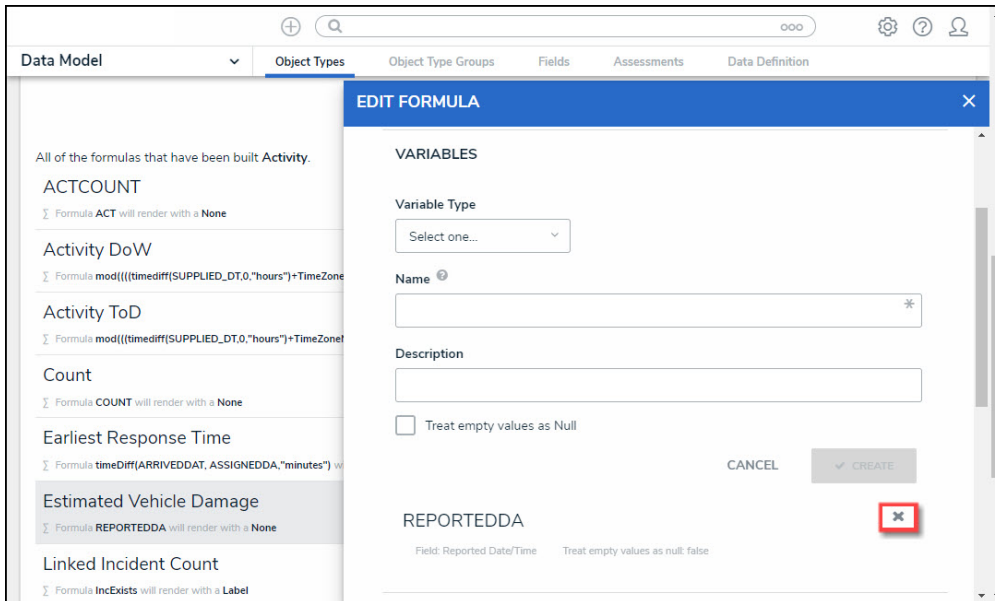
Note:

Click the **Expand** icon on the Formula field to open the **Expandable** screen mode.



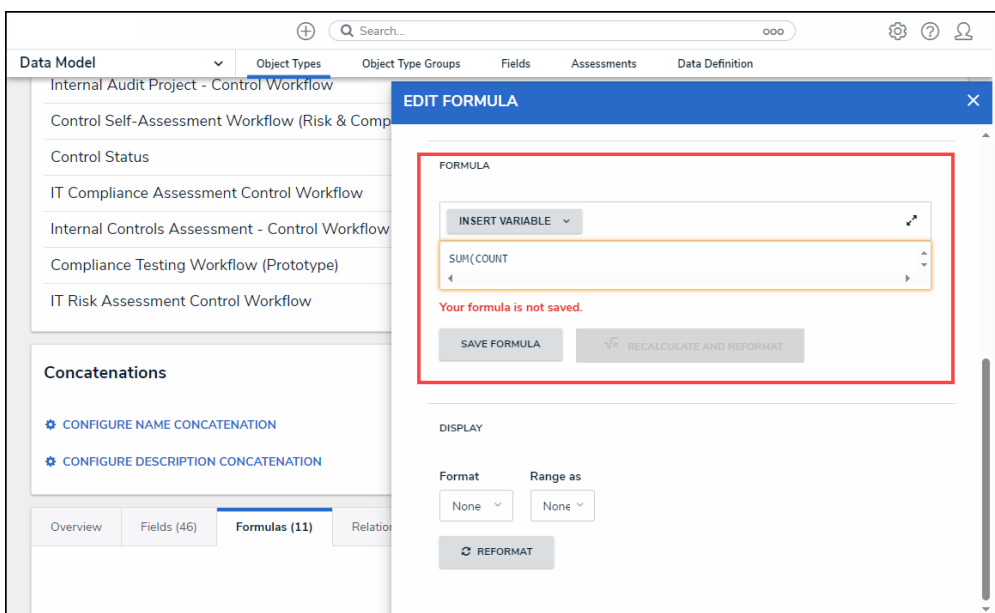
Expand Icon

15. Repeat steps 11 - 16 to add additional variables.
16. Click the **x** icon next to the variable to delete the variable.



X Icon - Delete a Variable

17. From the **Formula** section, enter a **Formula** using the variable name(s) you entered in the **Name** field under the **Variables** section. Include operators and functions in the **Formula** field (e.g., **INCIDENTSE==3**). For more information on Operators, see the Operators Table in the [Variables, Operators, & Functions](#) article.
18. A system notification will appear under the **Formula** field, indicating that **Your formula is not saved**.
19. The **Recalculate and Reformat** button will be greyed out, preventing invalid formulas from being sent to the processing queue and causing a potential slowdown.



System Notification - Your Formula is Not Saved

20. Click on the **Save Formula** button. The system will perform a Syntax Validation on the

formula if the formula is:

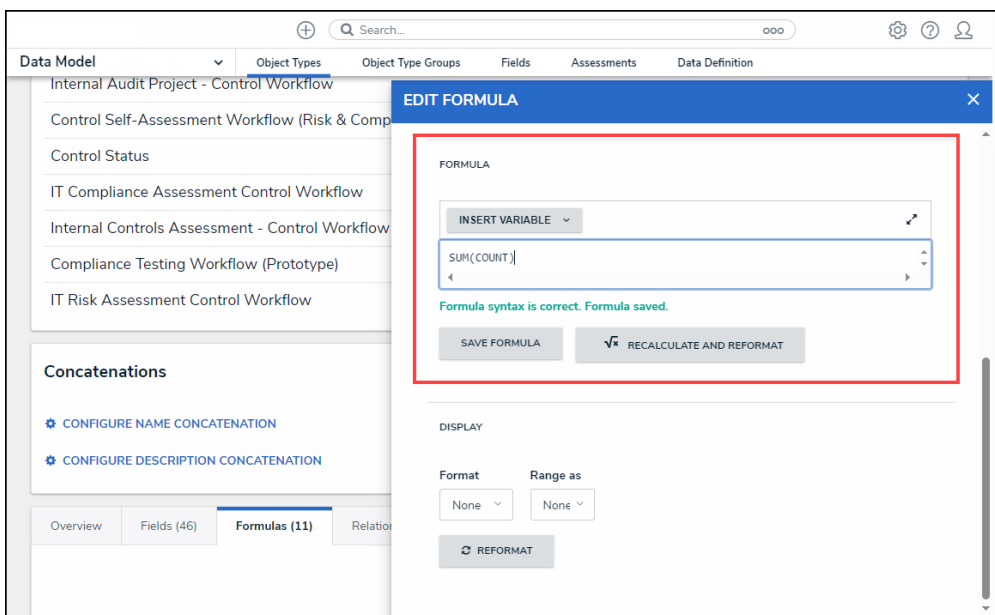


Warning:

The **Autosave** function was removed from the **Edit Formula** pop-up. Changes to the **Formula** field require a user to click the **Save Formula** button.

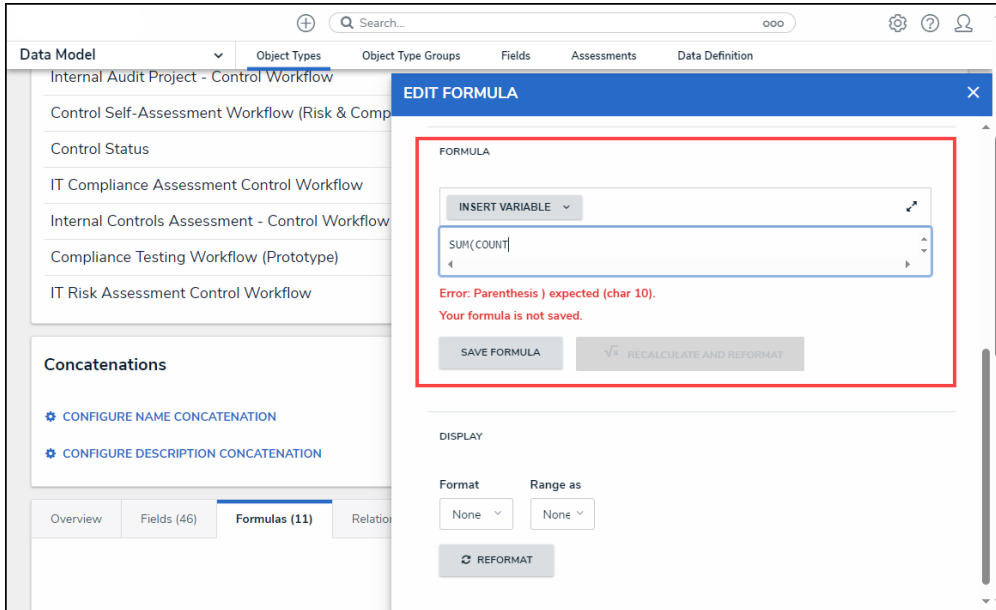
Changes not manually saved will be discarded, and the system will revert to the previously saved state.

- **Valid:** A system notification will appear under the **Formula** field; **Formula syntax is correct. Formula saved.** The **Recalculate and Reformat** button will be active.



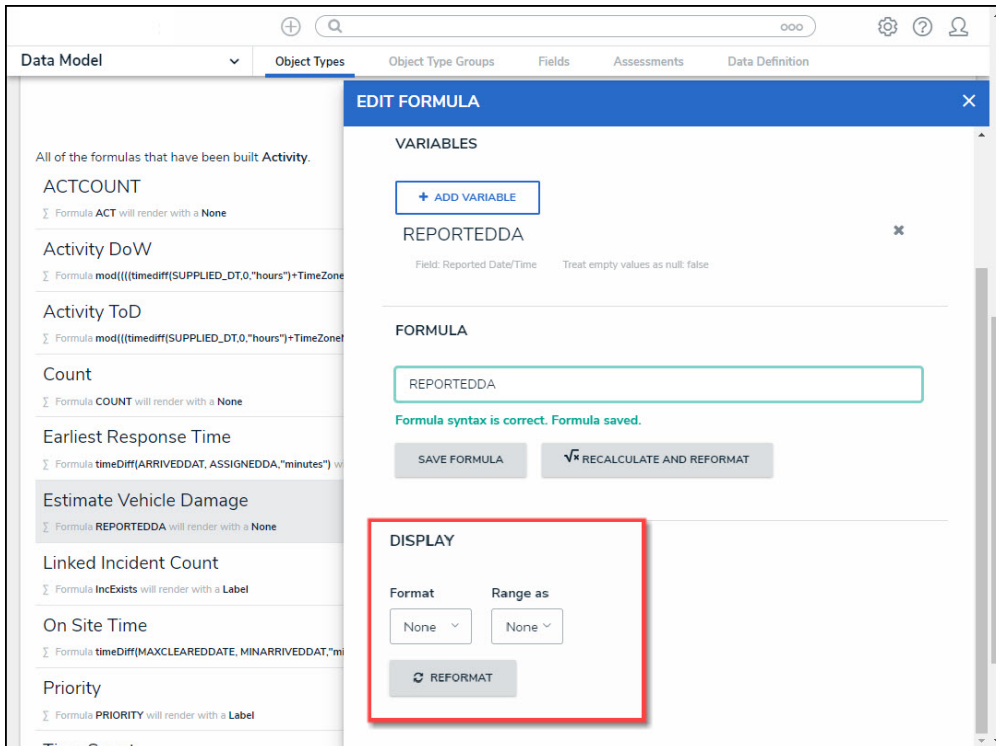
System Notification - Valid Formula

- **Invalid:** A system notification will appear under the **Formula** field; **Error Syntax error in part (char 1). The formula is not saved.** The error will indicate the character (char) location of the error in the formula and that the formula is invalid and not saved. The **Recalculate and Reformat** button will be greyed out, preventing invalid formulas from being sent to the processing queue and causing a potential slowdown.



System Notification - Invalid Formula

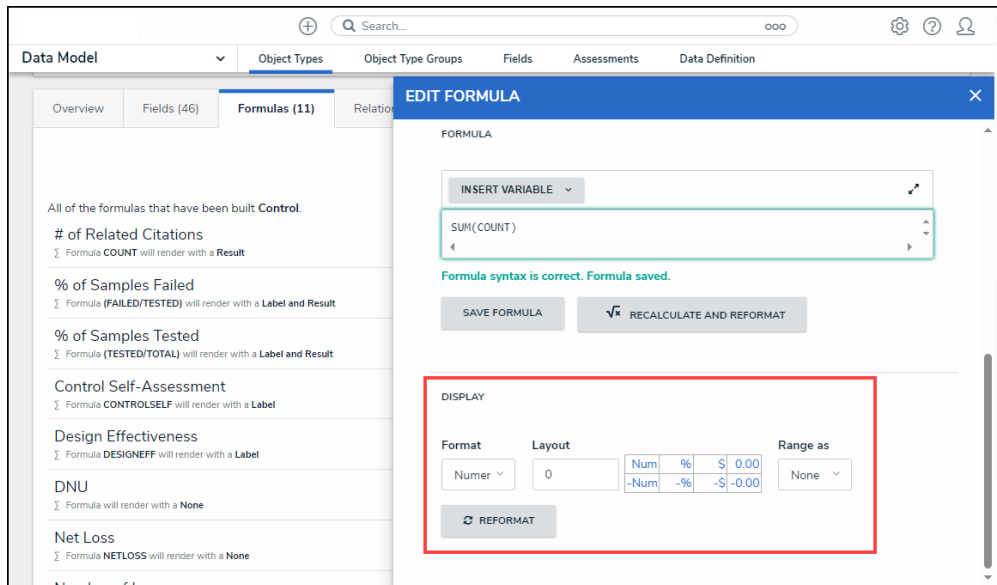
21. **(Optional)** Click the **Recalculate and Reformat** button to recalculate all the formulas in your organization.
22. In the **Display** section, select a format from the **Format** drop-down list:
 - **None:** Uses no display formats.



Format = None

- **Numeric:** Allows the user to choose how the numbers will be displayed using the options on the table.

- **Num:** Displays numbers in numeric format.
- **%:** Displays numbers using percentage format.
- **\$:** Displays numbers using dollar format.
- **0.00:** Displays numbers using decimal format.
- **Layout:** Previews the number format selected.

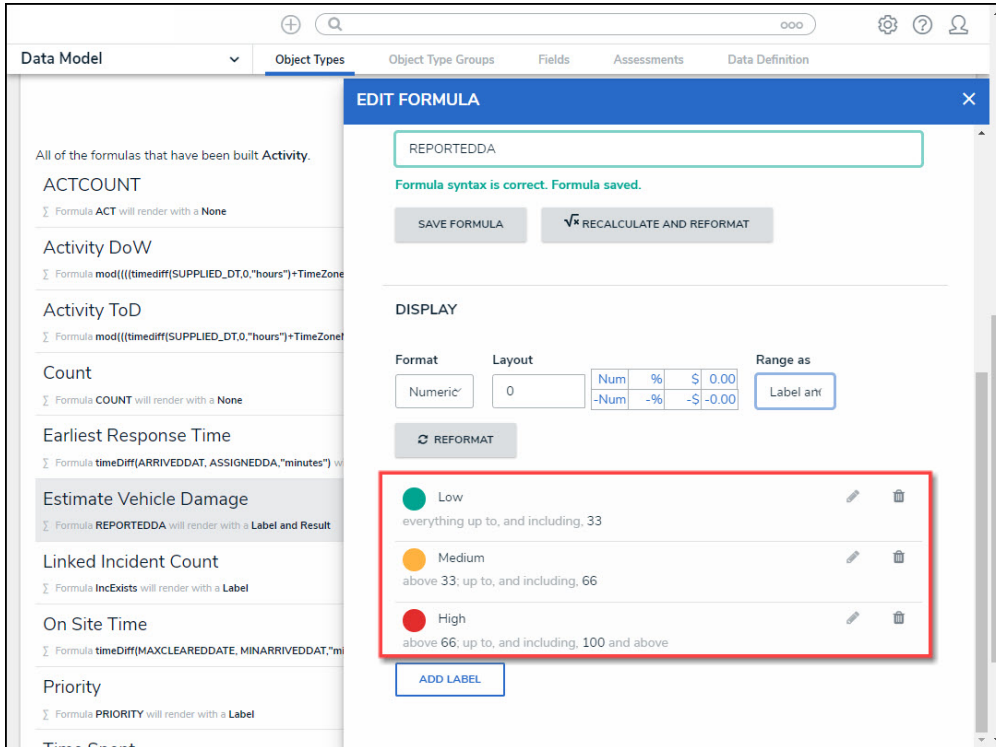


Format = Numeric

• **Range as:**

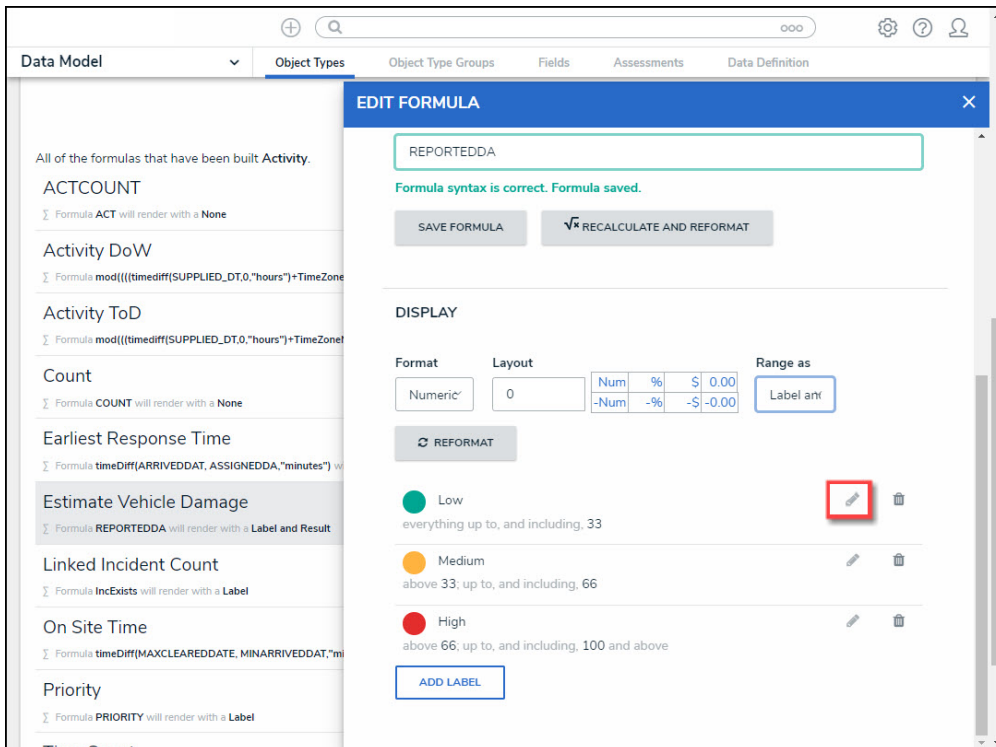
- **None:** The formula will display the numeric results only.
- **Label:** The formula will display the range labels only (e.g., Low, Medium, High) in the color selected for that range.
- **Label and Result:** The formula will display the numeric results and labels (e.g., Low - 1000) in the color selected for that range.
- **Result:** The formula will display the numeric results only in the color selected for that range.

23. If a user selects **Label**, **Label and Results**, or **Results** from the **Range as** drop-down list, the system will automatically add three default formula labels **Low**, **Medium**, and **High**.



Formula Labels

24. Click the **Edit** icon next to the **Formula Label** you want to edit.



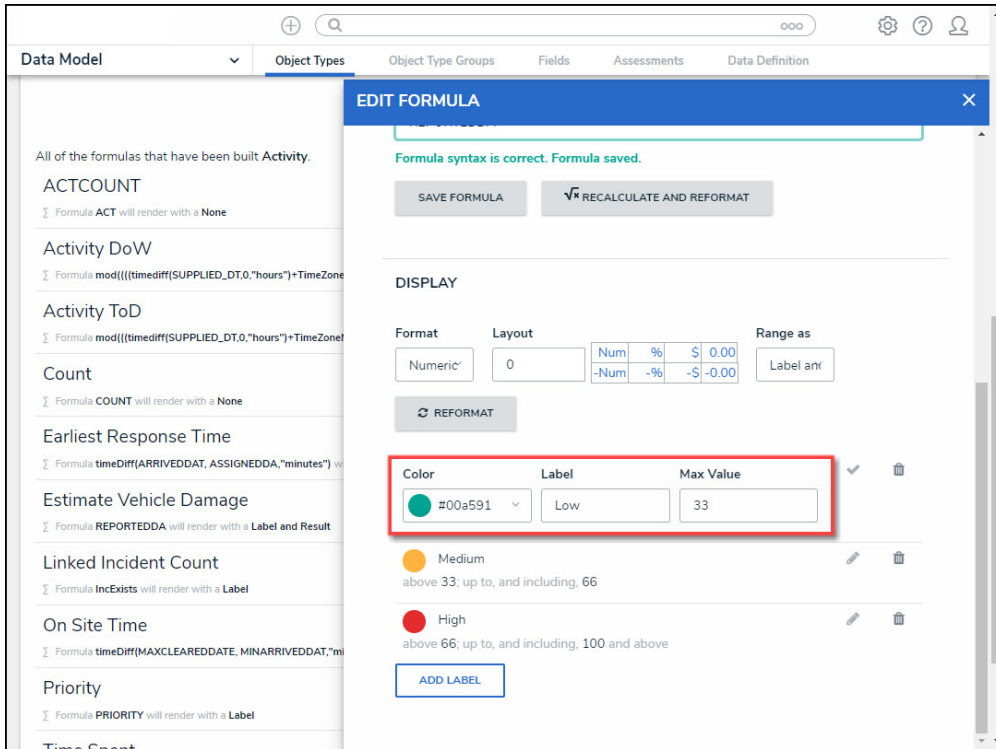
Edit Icon

25. The **Formula Label** fields will appear, allowing the user to edit the field values:

- **Color:** Click the **Color** drop-down to reveal the color picker and select a new color for

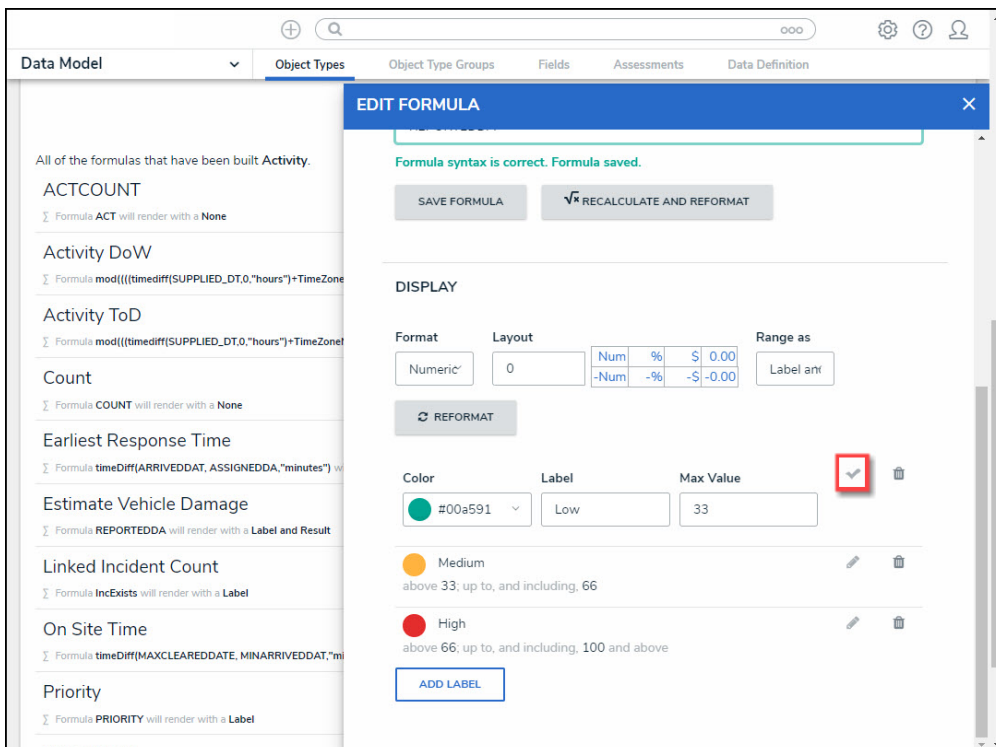
the label. You can also type a hex color into this field to select a color.

- **Label:** Enter a new name for the label in the **Label** field.
- **Max Value:** Enter a maximum value in the **Max Value** field, creating a numeric value range for the **Formula Label**.



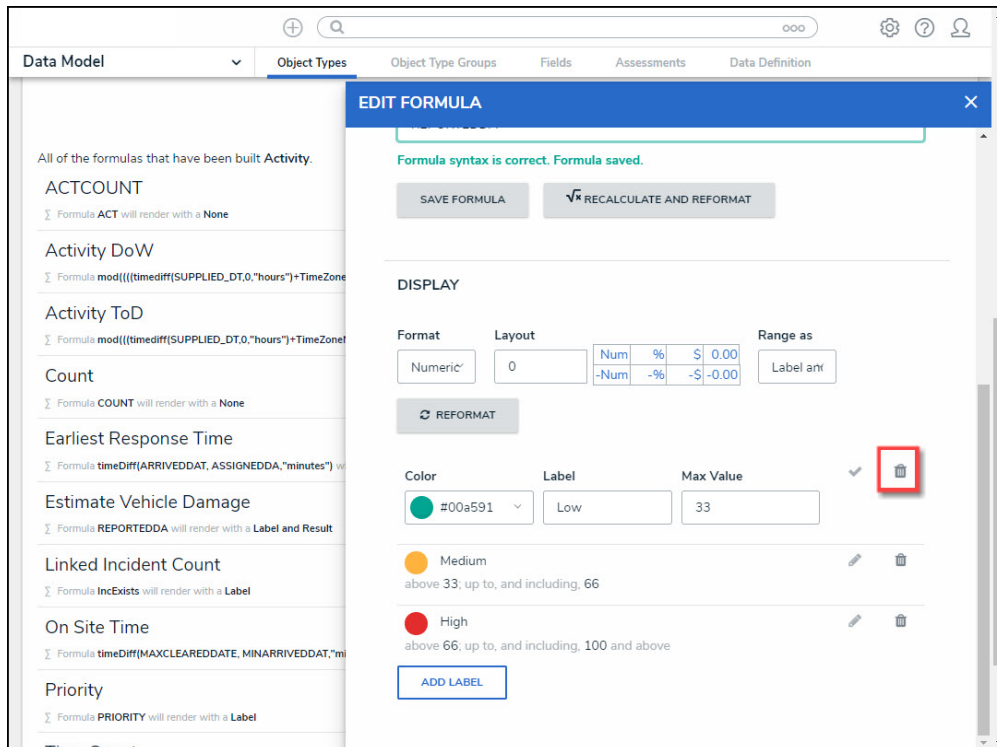
Formula Label Fields

26. Click the **Save** icon to save your changes.



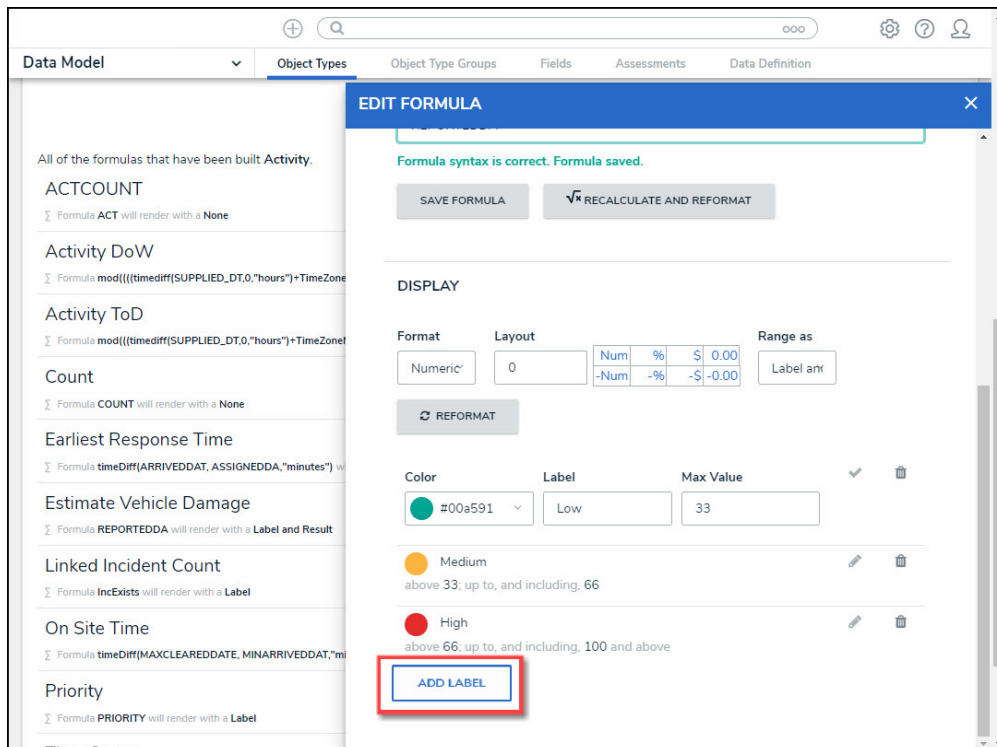
Save Icon

27. Click the **Delete** icon to delete a Formula Label.



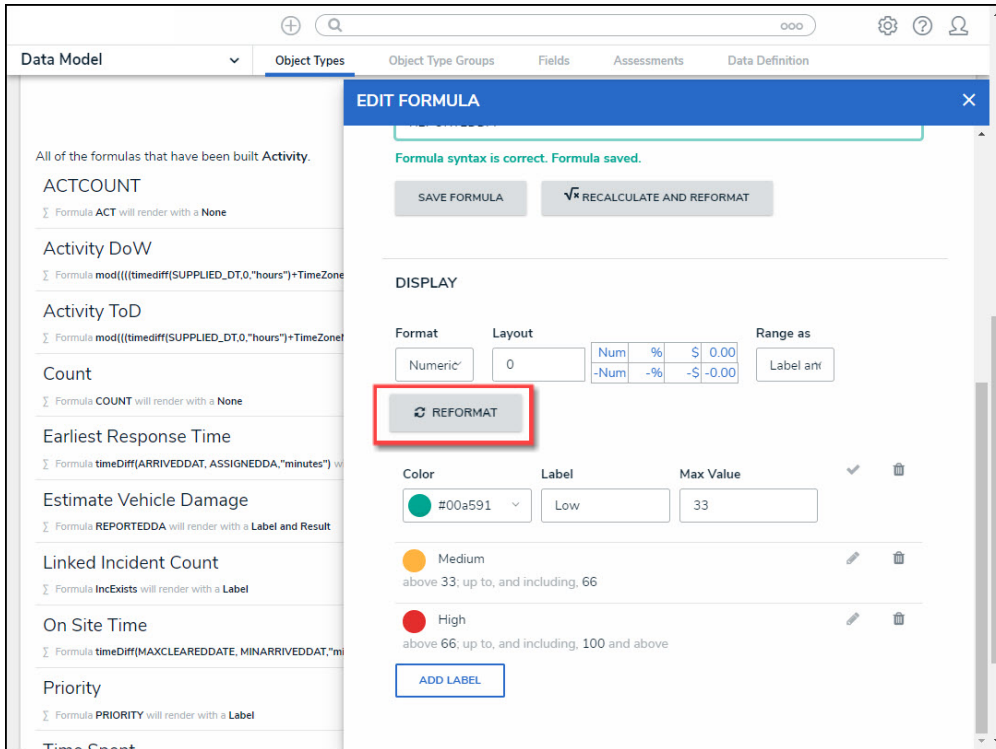
Delete Icon

28. Click **Add Label** button to add a new label.



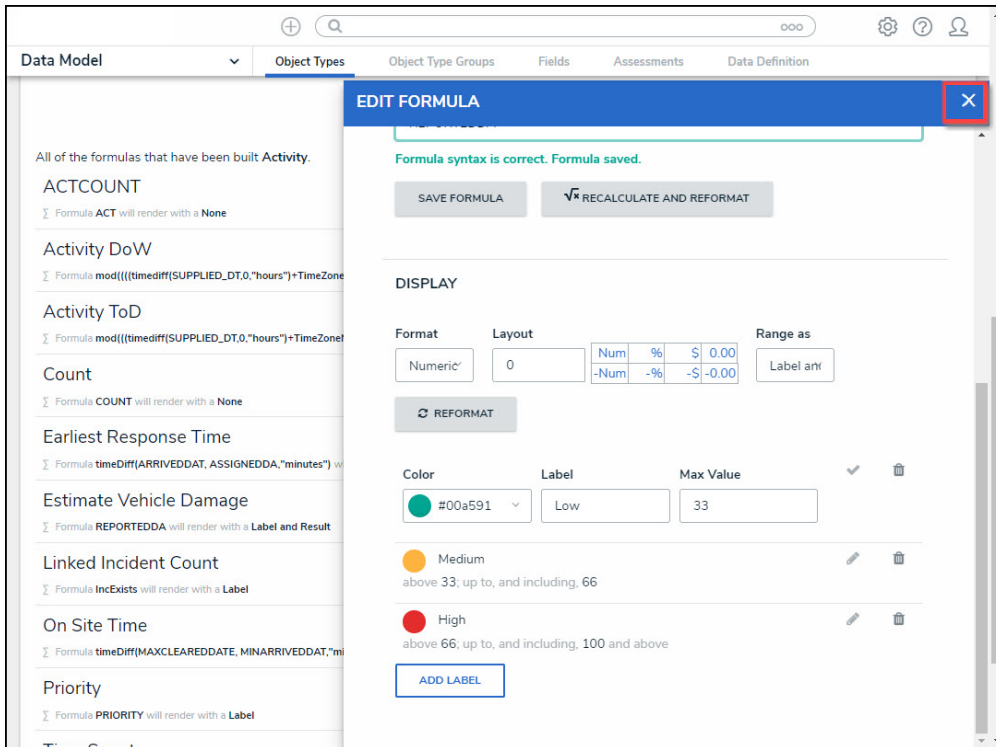
Add Label Button

29. If changes are made to the **Formula Label** on the **Display** section, you must click the **Reformat** button before the changes are displayed.



Reformat Button

30. Click the **x** in the **Edit Formula** pop-up header to close the pop-up.



x Closes the Edit Formula Pop-up

Add a Condition to a Transition

Overview

A **Condition** controls an object's movement to different states or performs a specific action. A **Condition** consists of fields, formulas, and workflow states that create a formula. The formula uses a set of parameters to control whether a transition or action can occur.

Related Information/Setup

For more information on formulas, see the following articles:

- [Formulas Overview](#)
- [Variables, Operators & Functions](#)
- [Null Values in Formulas](#)
- [Formula Examples](#)

Before adding a Condition to a Transition, you must create a State and a Trigger. See the following articles for more information on creating States and Triggers.

- [Create a New State](#)
 - [Add a Trigger and Transition to a State](#)
-

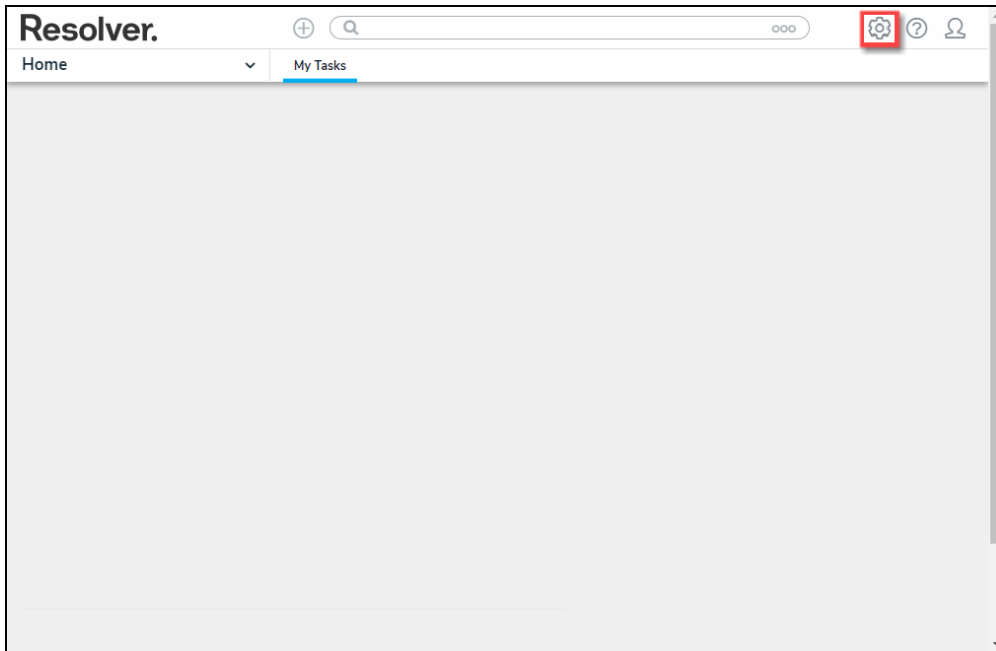
Example

The following example outlines an everyday scenario where you would want to add a condition to a transition.

Your company's policy for severe incidents is to skip the typical review process and transition to the investigation stage. Create a Condition on the Incident object type workflow for the **Submit for Review** trigger. If the "Severe" option is selected. The object is automatically transitioned to the **Investigation Required** state once the **Submit for Review** trigger is selected on a form.

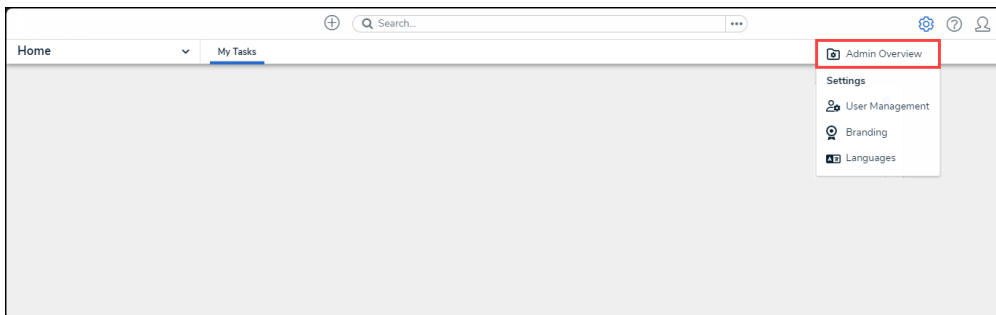
Navigation

1. From the **Home** screen, click the **Administration** icon.



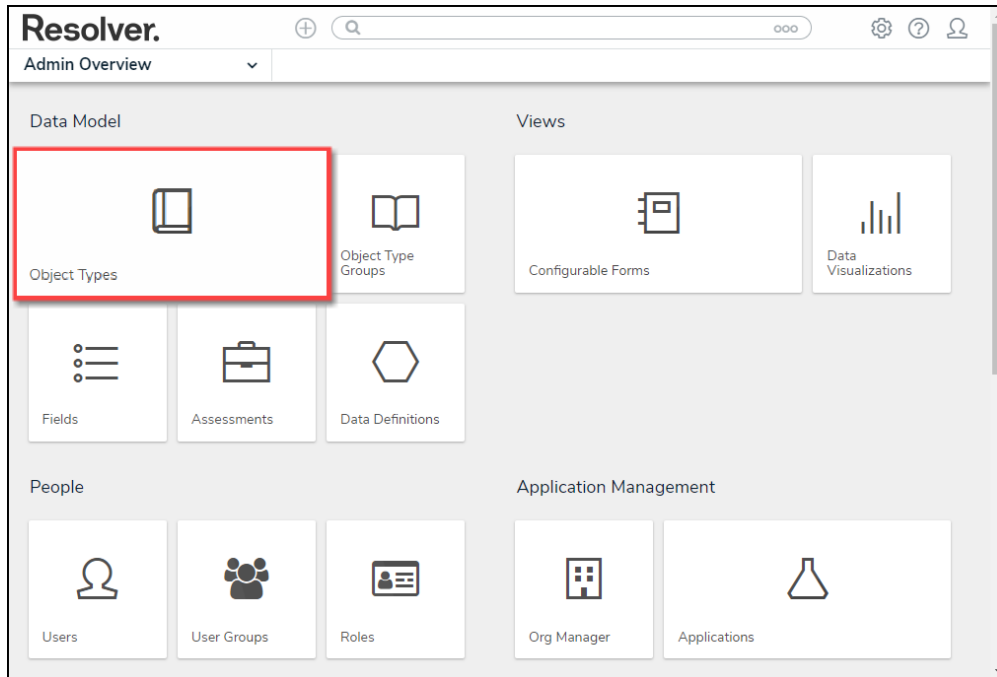
Administration Icon

2. From the **Administration Settings** menu, click the **Admin: Overview** link.



Admin: Overview Link

3. From the **Admin Overview** screen, click the **Object Types** tile on the **Data Models** section.



Object Types Tile

4. From the **Object Types** screen, enter an **Object Type Name** in the **Search** field to narrow down the list.
5. Click the **Object Type's Name** you want to edit.

The screenshot shows the Resolver Admin interface. At the top, there is a navigation bar with the Resolver logo, a search bar, and several icons. Below the navigation bar, there is a breadcrumb trail: Data Model > Object Types > Object Type Groups > Fields > Assessments > Data Definition. The main content area is titled 'Admin: Object Types' and includes a '+ CREATE OBJECT TYPE' button. A search bar contains the text 'Control'. Below the search bar, there is a list of object types, each with a circular icon and a description. The 'Control' object type is highlighted with a red box. The descriptions for the other object types are: Business Unit (BU), Certification (C), Market (M), Region (R), Request (R), and Test (T).

Resolver. + Q

Data Model Object Types Object Type Groups Fields Assessments Data Definition

Admin: Object Types + CREATE OBJECT TYPE

Q Control

BU Business Unit
A segment or subset of the company, which is often independent in its accounting and operational functionality. Primary organizational hierarchy providing security and ownership to key data objects including Incidents, Risks, **Controls** and Incident Types. Some standard reports are anchored at the Business Unit (BU) level.

C Certification
Statements signed off on by business users to certify on the effectiveness of **controls**.

C **Control**
The method an organization uses to manage risk, including policies, procedures, guidelines, practices, or organization structure, which can be of administrative, technical, management or legal nature.

M Market
Alternate organizational hierarchy providing security and ownership to key data objects including Incidents, Risks, **Controls** and Incident Types, most often used within Brand Protection use cases. Includes link to Business Unit and some anchored standard reports.

R Region
Alternate organizational hierarchy providing security and ownership to key data objects including Incidents, Risks, **Controls** and Incident Types, most often used within Loss Prevention use cases. Includes link to Business Unit and some anchored standard reports.

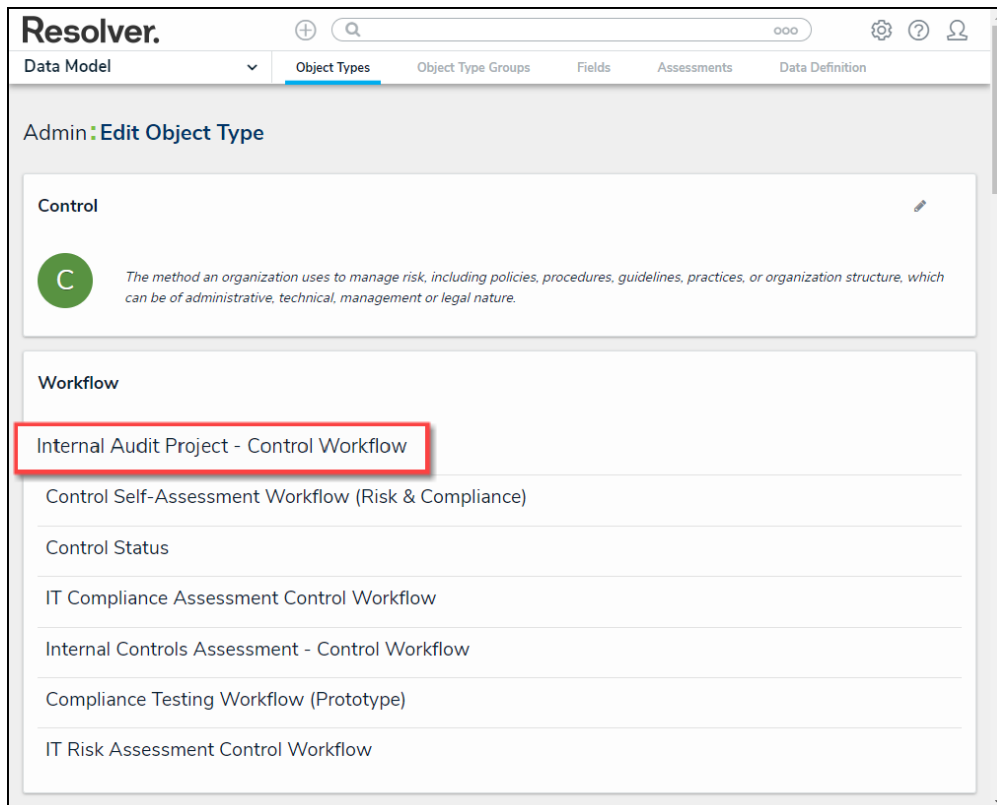
R Request
VRM: A request allows members of the business to request a vendor risk assessment. IA & IC: A request is sent by members of the internal audit **controls** team to an audit client/request owner to provide documentation to assist with completion of the audit **control** testing.

T Test
A method used to test the operating and design effectiveness of a **control**, which may include various testing methods or strategies.

VIEW OBJECT TYPE UNIVERSE

Click the Object Type's Name

6. From the **Edit Object Type** screen, click on a workflow under the **Workflow** section.



Click on a Workflow

7. If there are no workflows listed, click on the **Configure Workflow** button.



Configure Workflow Button

8. From the **Edit Workflow** screen, click a **Trigger** under the **State** section.



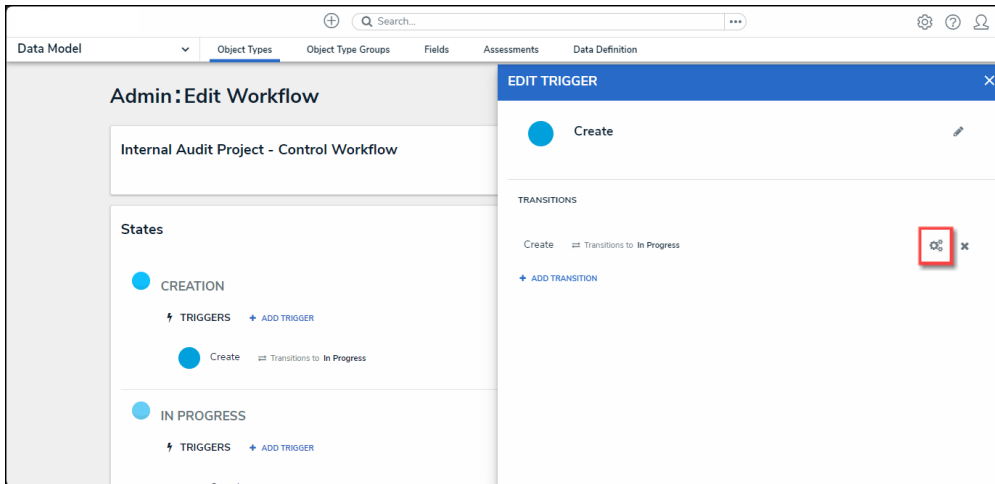
Note:

You must already have a **Trigger** added to a **State** before you can add a condition to a transition.

The screenshot shows the Resolver interface for editing a workflow. At the top, there's a navigation bar with 'Data Model' and 'Object Types' (selected). Below that, the title 'Admin: Edit Workflow' is displayed. The main content area is titled 'Internal Audit Project - Control Workflow'. It lists four states: CREATION, IN PROGRESS, COMPLETE, and ARCHIVE. Each state has a 'TRIGGERS' section with an 'ADD TRIGGER' button and a 'REQUIRED COMPONENTS' indicator. The 'CREATION' state is highlighted with a red box around the 'Create' trigger, which is linked to 'In Progress'. Other transitions include 'Complete' to 'Complete' and 'OE: Archive (from Audit Project)' to 'Archive'. A 'SHOW MORE...' link is visible under the COMPLETE state. A 'DONE' button is at the bottom right.

Click on a Trigger

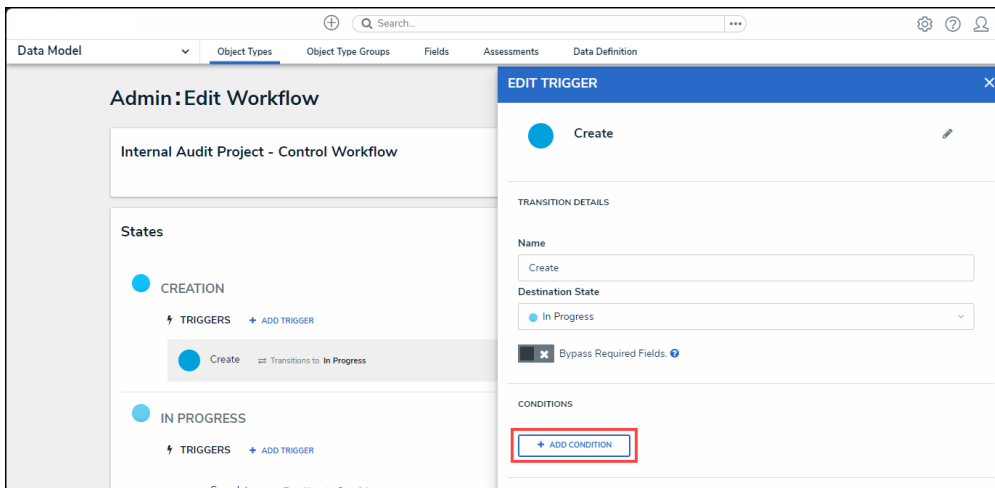
9. From the **Edit Trigger** pop-up, click the **Edit** icon next to the transition.



Click the Edit Icon

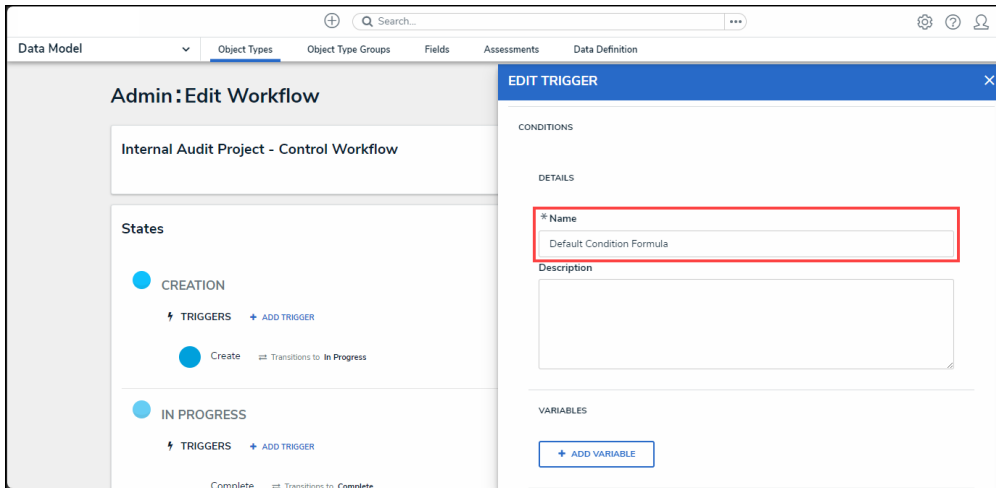
Adding a Condition on a Transition

1. From the **Condition** section, click the **+Add Condition** button.



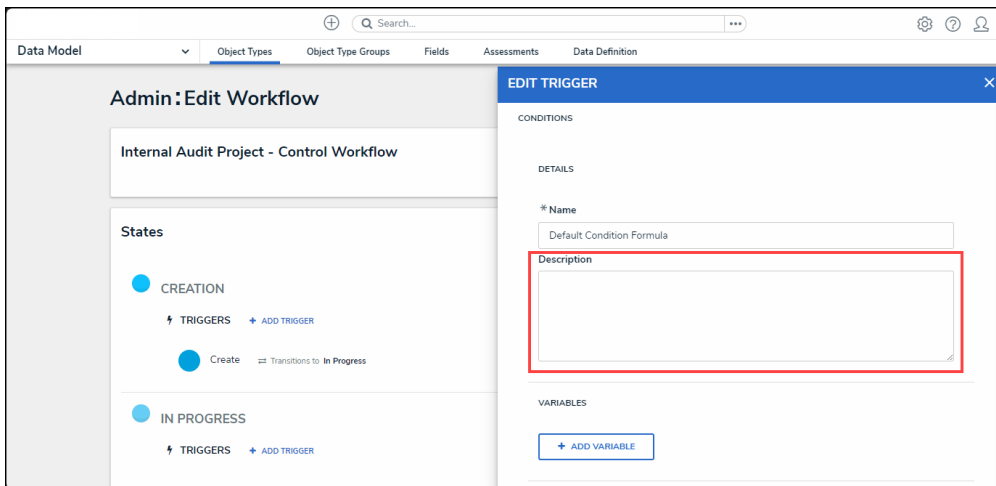
+ Add Conditions Button

2. **(Optional)** Enter a condition name in the **Name** field under the **Details** section. By default, conditions are named **Default Condition Formula**.



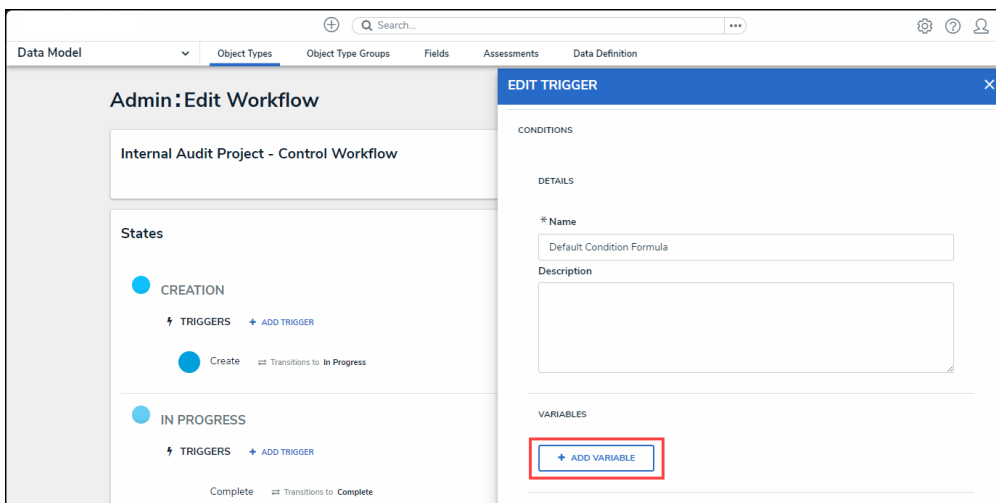
Name Field

3. **(Optional)** Enter a brief condition description in the **Description** field.



Description Field

4. From the **Variables** section, click the **+Add Variable** button.



+Add Variable Button

5. From the **Variables** section, select a **Variable Type** from the drop-down list. A **Variable** is a value in which the formula calculations are performed.

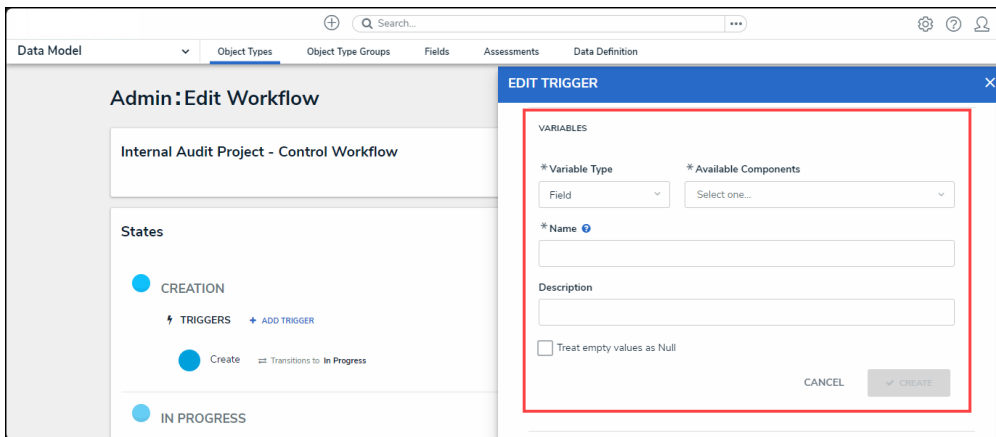
- **Field:** After selecting the **Field** variable, the following field will appear:
 - **Available Components:** Select a field or formula from the **Available Components** drop-down field adding it directly to the Object Type.



Note:

Fields must be added to a formula after an Object Type or through an association (Relationship or Reference).

Only numeric fields, date fields, and select lists (numeric values) are accepted. For more information, see the [Fields](#) article.

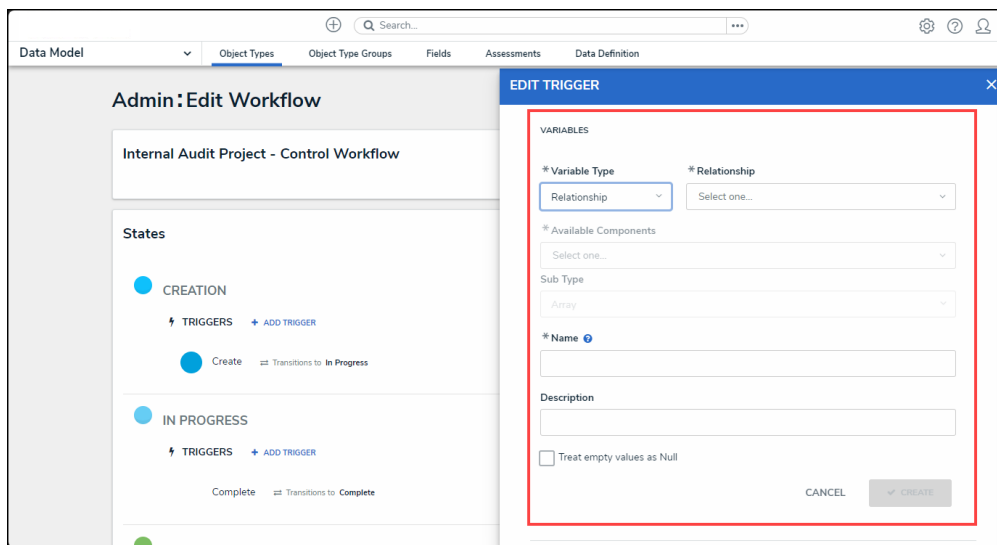


Variable Type = Field

- **Relationship:** After selecting the **Relationship** variable, the following fields will appear:
 - **Relationship:** Select the Object Type **Relationship** from the drop-down list. Relationships connect two or more objects. Relationships must be added to an Object Type to appear on the Relationship drop-down list. See the [Add Relationships to an Object Type](#) article for further information on adding a Relationship to an Object Type.
 - **Available Components:** Select a field or formula from the **Available Components** drop-down field adding it directly to the Object Type.
 - **Sub Type:** Select a **Sub Type** from the drop-down list. Subtypes specify how the data from multiple objects are compiled, calculated, and displayed. For more information on Subtypes, see the Sub Type Table in the [Variables, Operations, & Functions](#) article.
 - **Array:** Creates a set of values from the variable.
 - **Sum:** Calculates a total from the variable's set of values and returns a

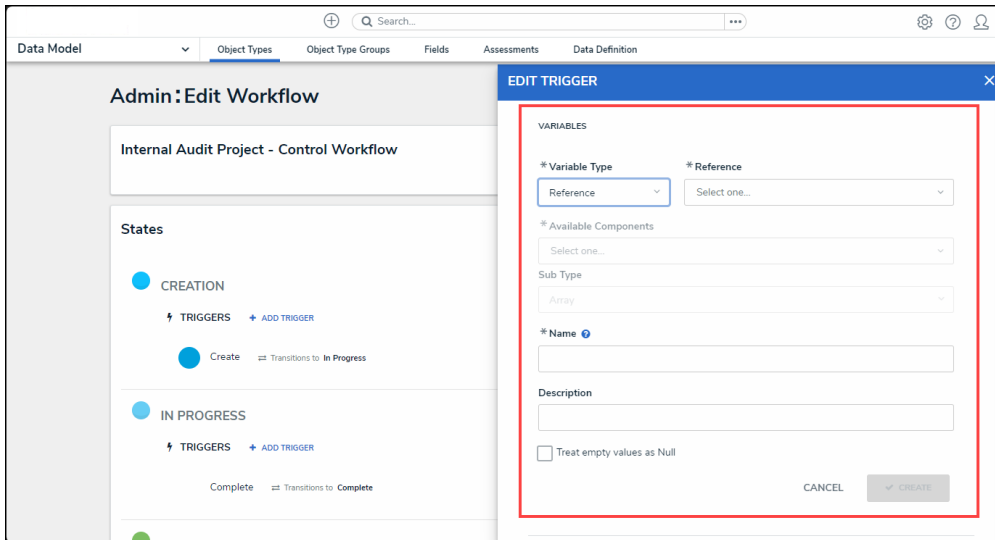
single number. Select list variables cannot use Sum Sub Types.

- **Count:** The number of times a variable has been added to an object.
- **Average:** Calculates an average number from the variable's set of values. Select list variables cannot use Average Sub Types.
- **Every:** Checks if the variable contains a value on the objects in the relationship/reference.
- **Min:** Calculates the lowest number from the variable's set of values. Select list variables cannot use Min Sub Types.
- **Max:** Calculates the highest number from the variable's set of values. Select list variables cannot use Max Sub Types.



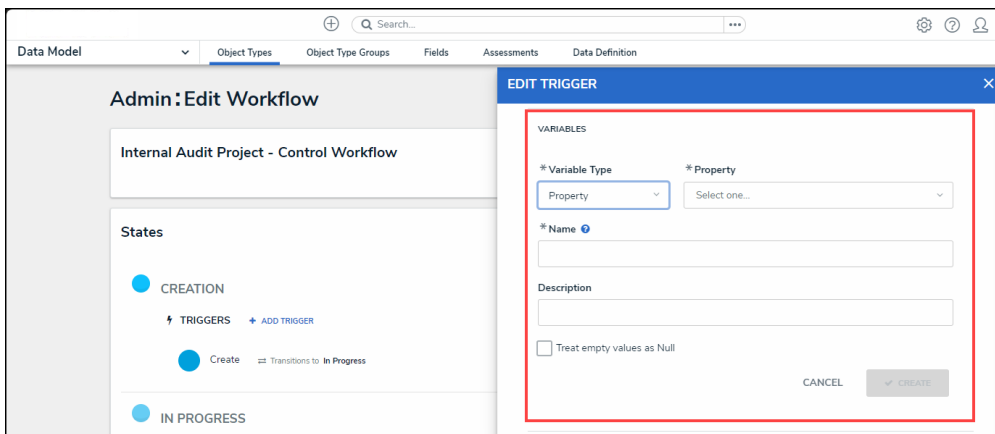
Variable Type = Relationship

- **Reference:** After selecting the **Reference** variable, the following fields will appear:
 - **Reference:** Select the Object Type **Reference** from the drop-down list. References indicate that an object is connected to another object through a relationship. References are automatically created when a relationship is created. For further information on adding a Relationship to an Object Type, see the [Add References to an Object Type](#) article.
 - **Available Components:** Select a field or formula from the **Available Components** drop-down field adding it directly to the Object Type.
 - **Sub Type:** Select a **Sub Type** from the drop-down list. Subtypes specify how the data from multiple objects are compiled, calculated, and displayed.



Variable Type = Reference

- **Property:** After selecting the **Property** variable, the following field will appear:
 - **Property:** Select a **Property** type from the drop-down list:
 - **Is Submitter Confidential:** This property type creates a formula that compares the number of confidential submissions against the number of not confidential submissions for customers that use the **Confidential Reporting Portal**.



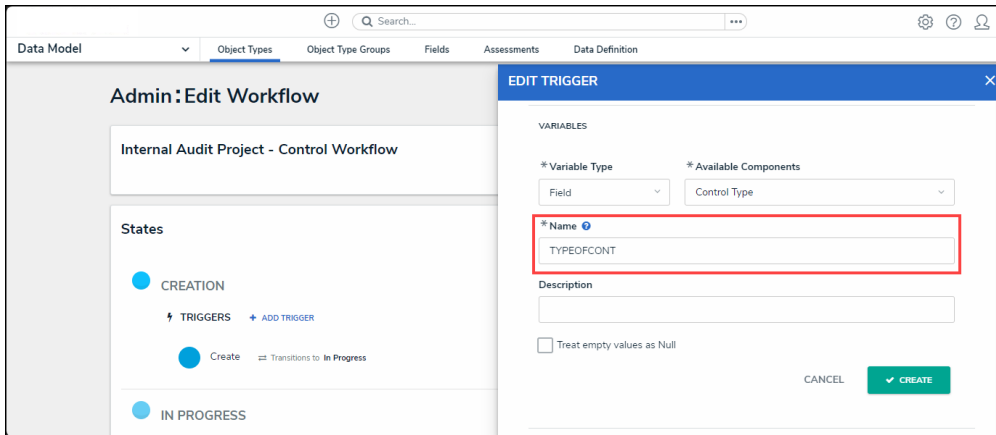
Variable Type = Property

6. The system will automatically populate the Name field with the field or formula's unique ID by default.
7. **(Optional)** Enter a Variable name in the **Name** field.



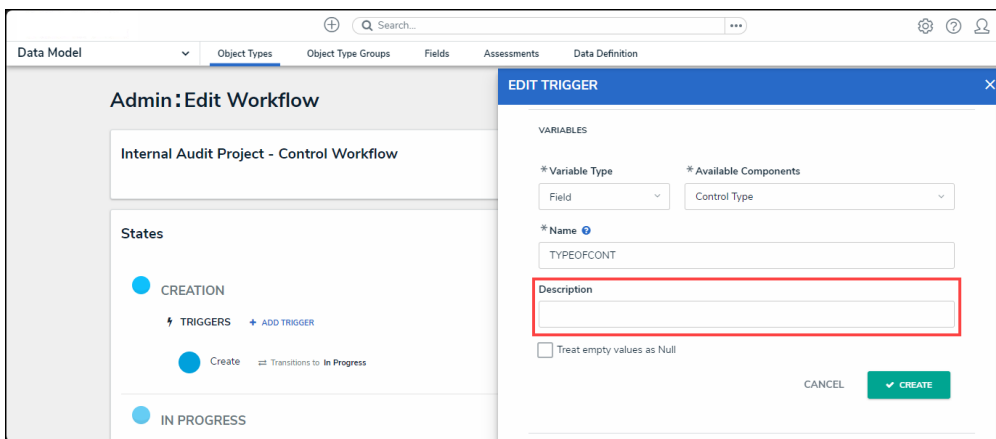
Warning:

Using a function name (Sub Type Name) in the name field will cause an error.



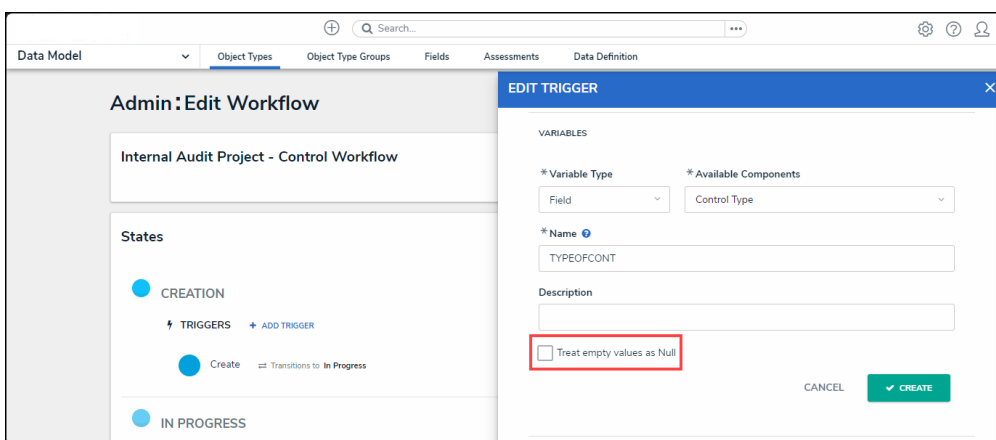
Variable Name

8. **(Optional)** Enter a Variable description in the **Description** field.



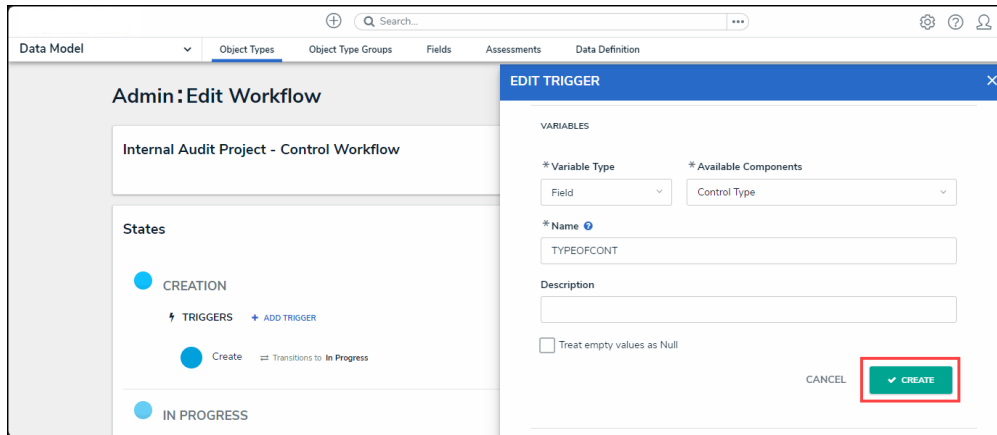
Description Field

9. **(Optional)** Select the **Treat empty values as Null** checkbox, to exclude blank objects from a formula calculation. For more information, see the [Null Values in Formulas](#) article.



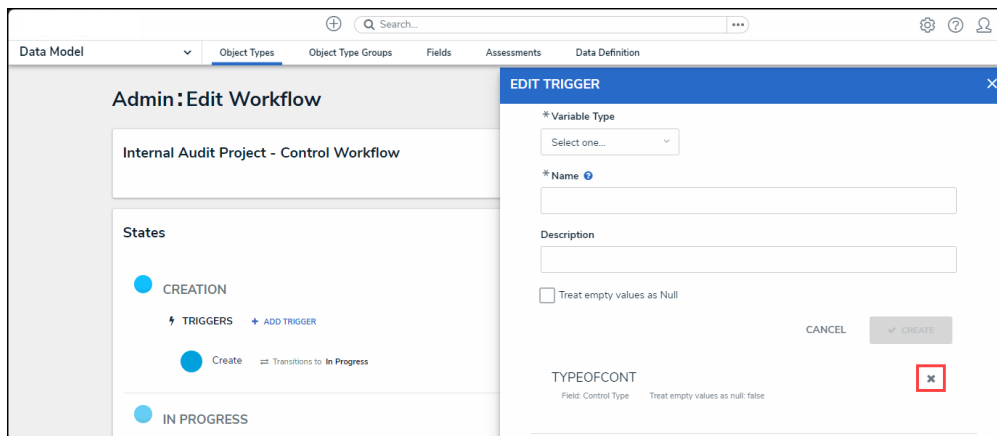
Treat Empty Value as Null Checkbox

10. Click the **Create** button to add the variable.



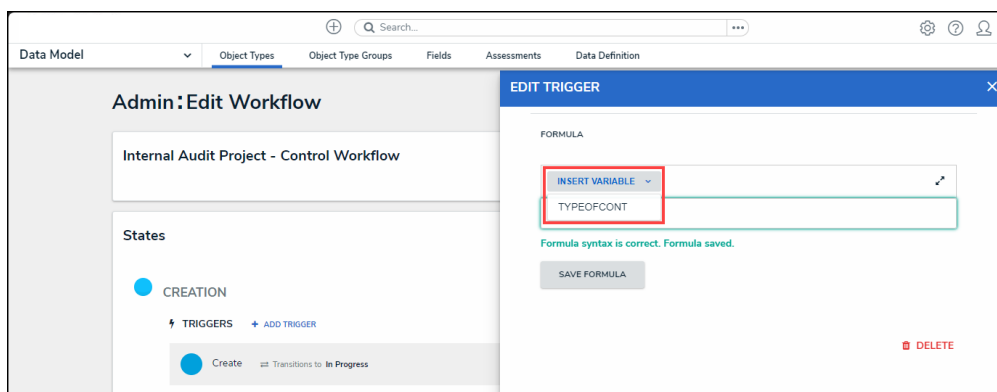
Create Button

11. Repeat steps 7 - 16 to add additional variables.
12. Click the **x** icon next to the variable to delete the variable.



X Icon - Delete a Variable

13. **(Optional)** Click the **Insert Variable** button and select a variable from the dropdown list to use within the **Formula** field.

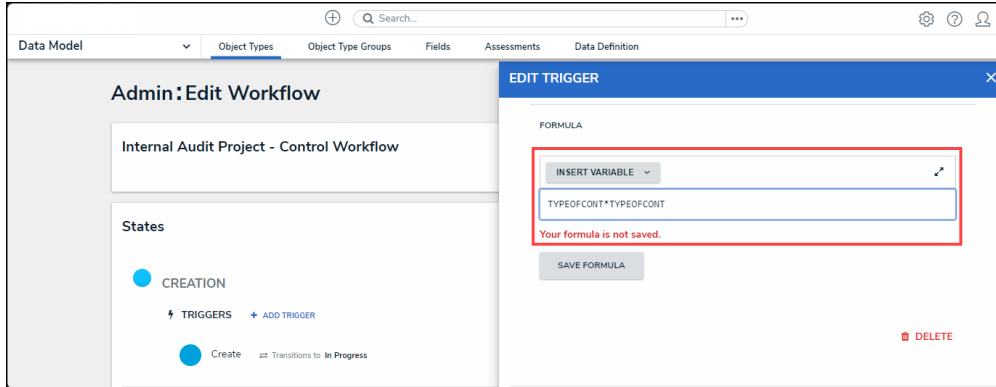


Insert Variable Button

14. From the **Formula** section, enter a **Formula** using the variable name(s) you entered in the **Name** field under the **Variables** section. Include operators and functions in the

Formula field (e.g., **INCIDENTSE==3**). For more information on Operators, see the Operators Table in the [Variables, Operators, & Functions](#) article.

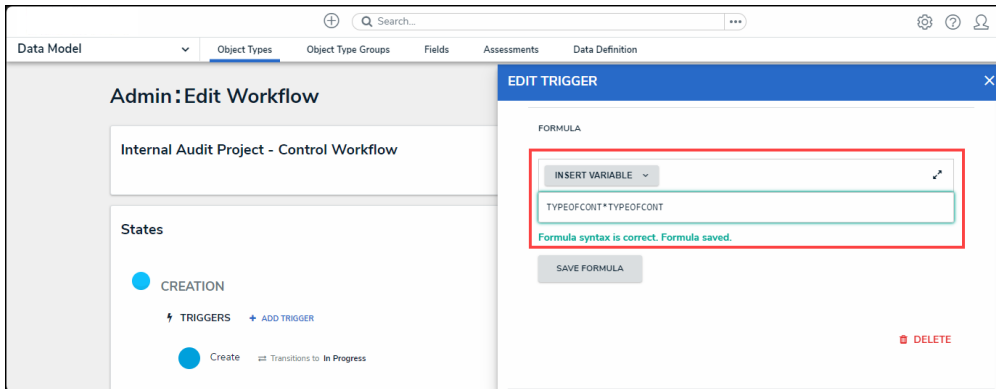
15. A system notification will appear under the **Formula** field, indicating that **Your formula is not saved.**



System Notification - Your Formula is Not Saved

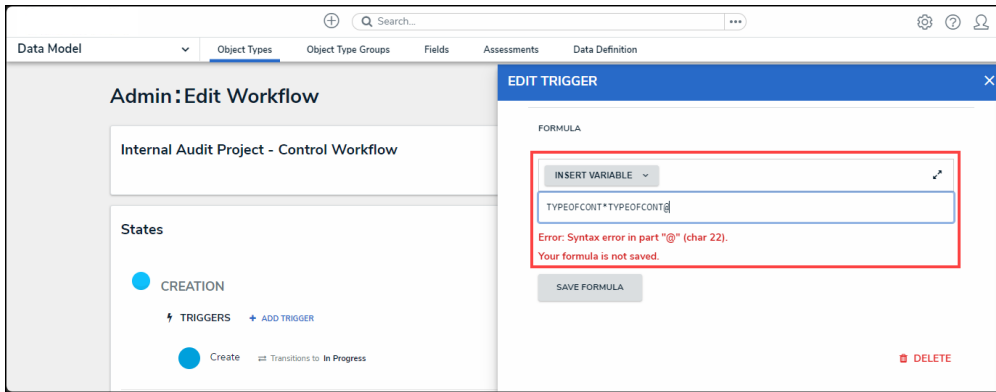
16. Click on the **Save Formula** button. The system will perform a Syntax Validation on the formula if the formula is:

- **Valid:** A system notification will appear under the **Formula** field; **Formula syntax is correct. Formula saved.**



System Notification - Valid Formula

- **Invalid:** A system notification will appear under the **Formula** field; **Error Syntax error in part (char 1). The formula is not saved.** The error will indicate the character (char) location of the error in the formula and that the formula is invalid and not saved.



System Notification - Invalid Formula

17. Syntax Validation helps to prevent users from saving invalid formula expressions, which can negatively impact APIs.
18. Click the **Done** button to add the Variables to the Object Type.