

CEE 5614 - Analysis of Air Transportation Systems

Quick Review of AEDT



Start a New Scenario

- Starts a new airport analysis

The screenshot shows the 'Study' menu on the left with options: Open, Migrate, Import, Partial Import, New, Delete, Close, Recent, Tasks, and Log. The main area contains buttons for 'Open AEDT Log', 'Open Logs Folder', 'Open Study Run Log', and 'Open Study Output Folder'. A 'Clear Messages' button is also present. A message log table is displayed with the following data:

Drag a column header and drop it here to group by that column			
Level	Time Stamp	Module	Message
(i)	4/1/2024 6:36:14 AM	GUI	Validated ArcGIS Runtime license
(i)	4/1/2024 6:36:14 AM	GUI	Started LocalServer for ArcGIS Runtime for WPF.
(i)	4/1/2024 6:36:17 AM	GUI	AEDT 3f AEDT version: 210.0.19778.1
(i)	4/1/2024 6:36:17 AM	GUI	Telerik version: 2023.1.117.45
(i)	4/1/2024 6:36:17 AM	GUI	ArcGIS Runtime for WPF version: 10.2.5.0
(i)	4/1/2024 6:36:17 AM	GUI	.NET Runtime version: 4.0.30319.42000
(i)	4/1/2024 6:36:17 AM	GUI	OS Name: Microsoft Windows 11 Home
(i)	4/1/2024 6:36:17 AM	GUI	OS Version: Microsoft Windows NT 6.2.9200.0

Define Your New Scenario

- Creates a new scenario
- Connects to the SQL express (database)

Create New Study

Study name:
BCB_study

Study description:
My first study for BCB

Database server:
(local)\sqlexpress

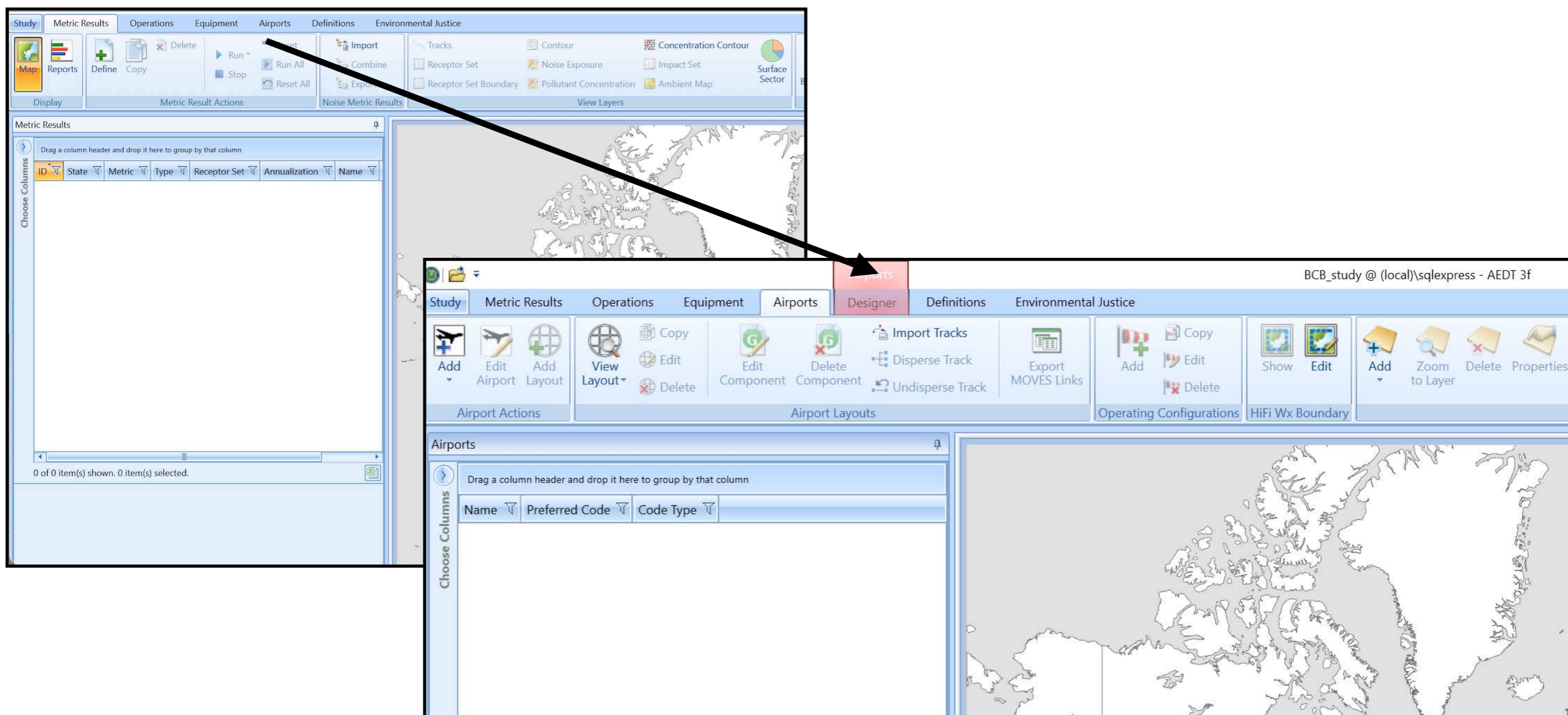
Test Connection

▼ Credentials

New Cancel

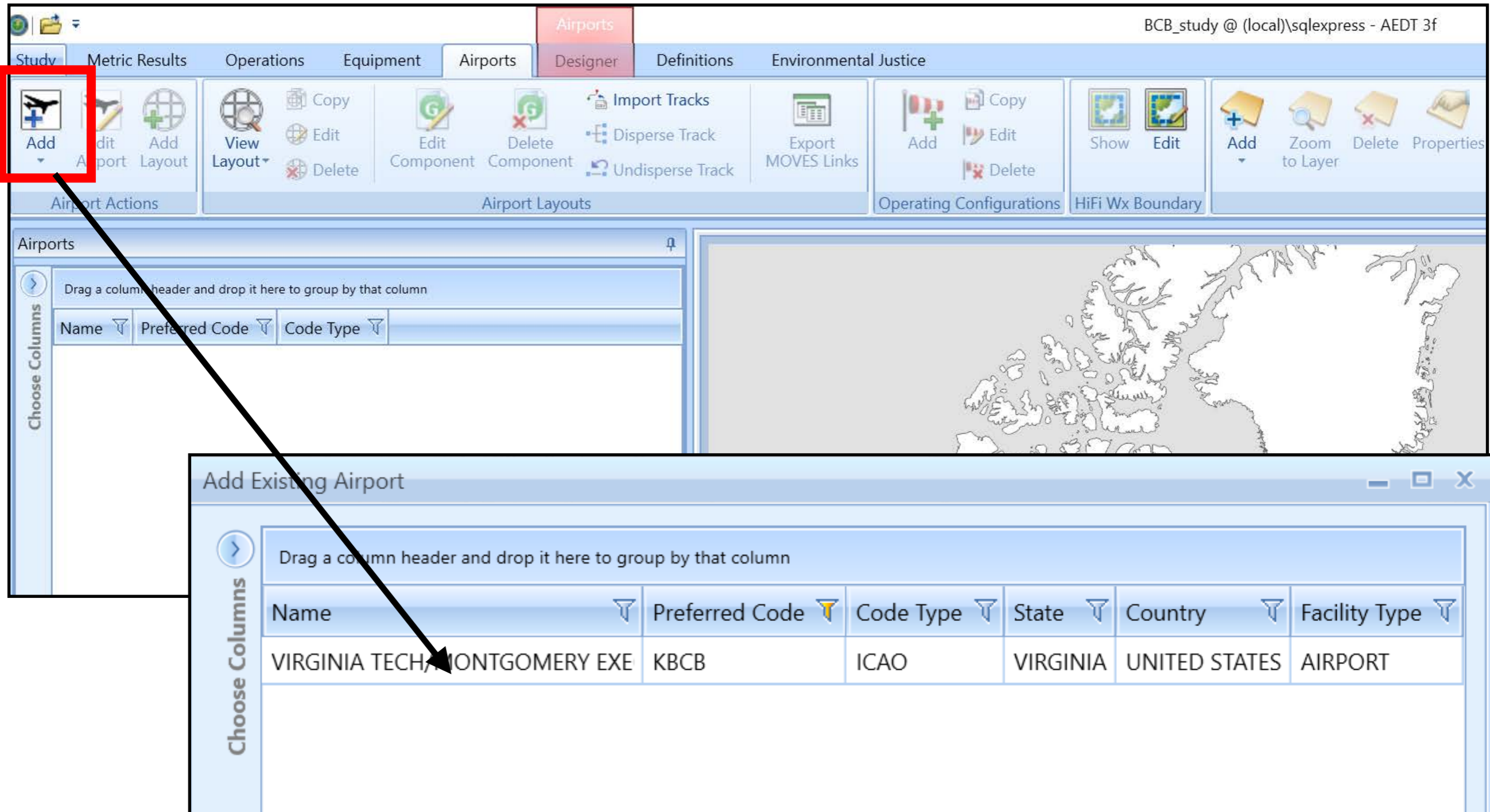
Define Your New Scenario

- Ready to define our airport
- You can define the runway coordinates or use the large worldwide database inside AEDT



Add Your Airport

- You can define the runway coordinates or use the large worldwide database inside AEDT

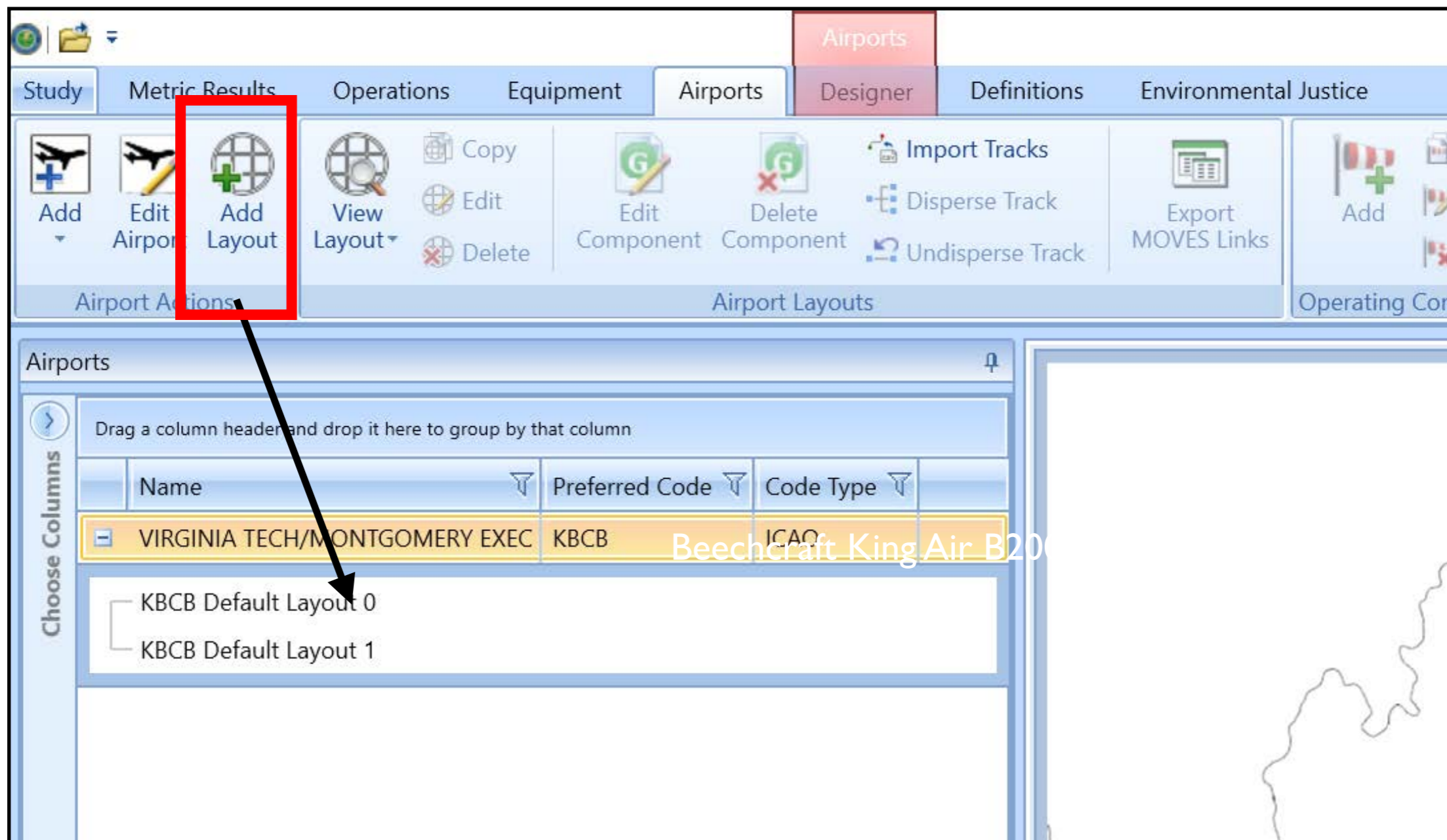


The screenshot shows the AEDT software interface with the 'Airports' ribbon selected. The 'Add' button in the 'Airport Actions' group is highlighted with a red box. An arrow points from this button to a dialog box titled 'Add Existing Airport'. The dialog box contains a table with the following data:

Name	Preferred Code	Code Type	State	Country	Facility Type
VIRGINIA TECH, MONTGOMERY EXE	KBCB	ICAO	VIRGINIA	UNITED STATES	AIRPORT

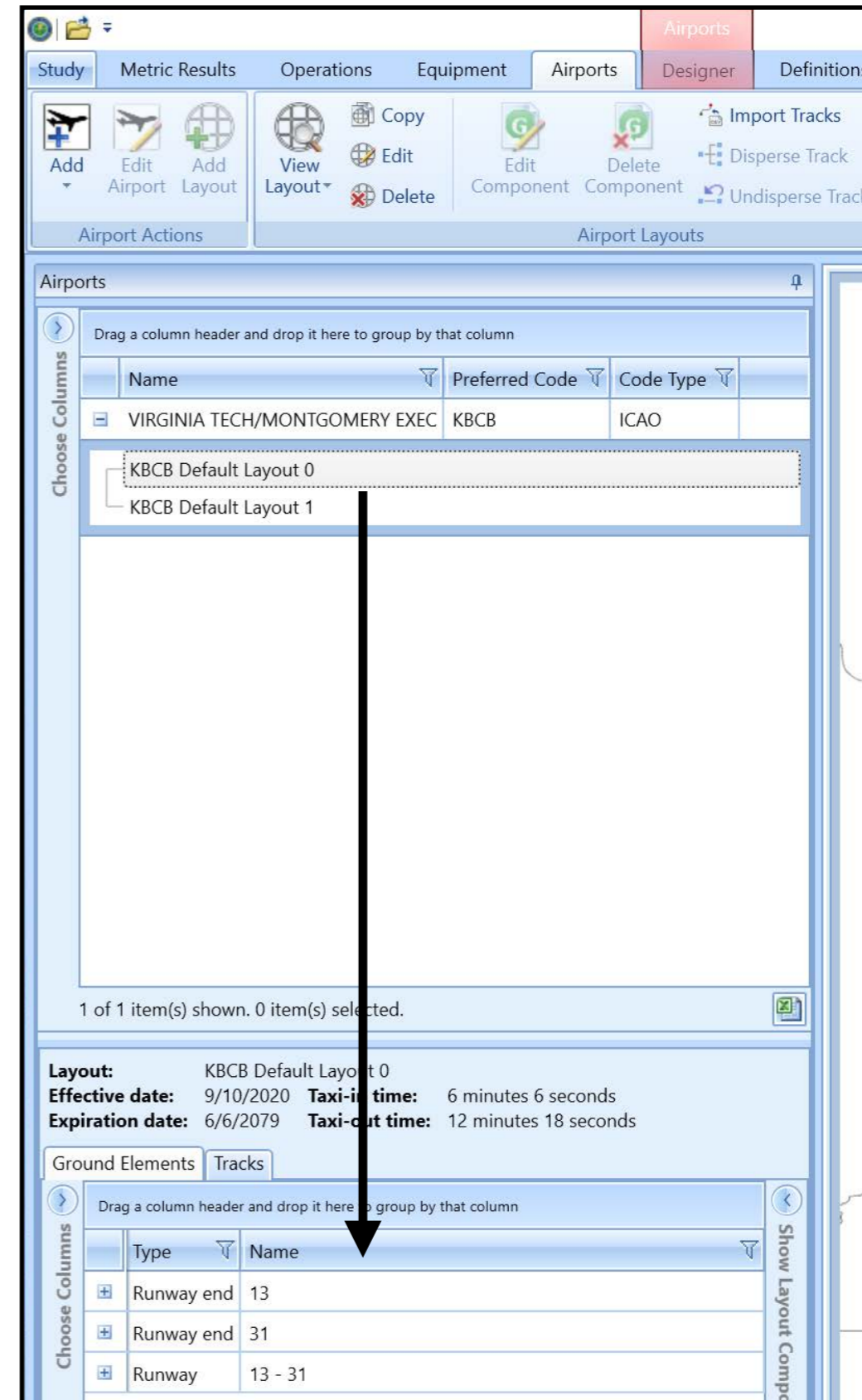
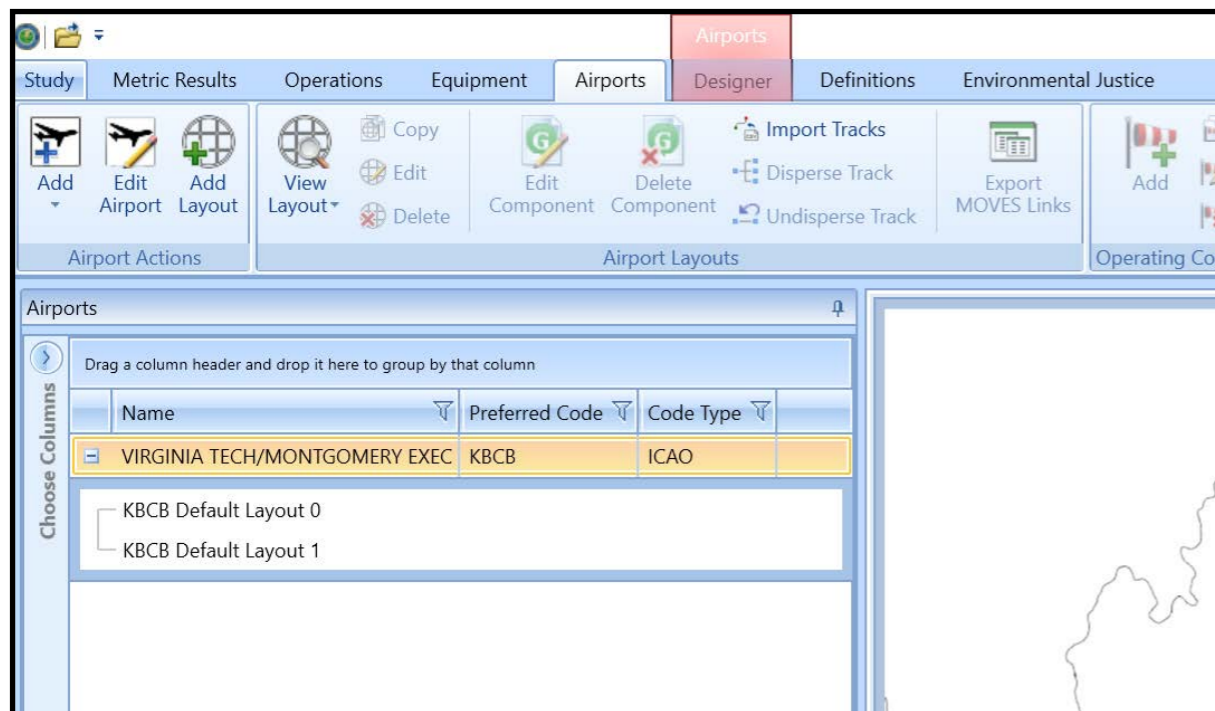
Add an Airport Layout

- Layouts show airports at different points in time
- Example Default Layout 1 shows the airport before the runway extension



Verify the Airport Information

- Layouts show airports at different points in time



Airport Runway Information

- The airport runways show in the map window

The screenshot displays the 'Airport Designer' software interface. The main map window shows a runway layout with two runway ends labeled 'R 13' and 'R 31' connected by a red line. A 'Task Completed' dialog box is visible in the foreground, indicating that the 'Generate airport layout layer' task has been successfully completed.

Airports Table:

Name	Preferred Code	Code Type
VIRGINIA TECH/MONTGOMERY EXEC	KBCB	ICAO

Layout Details:

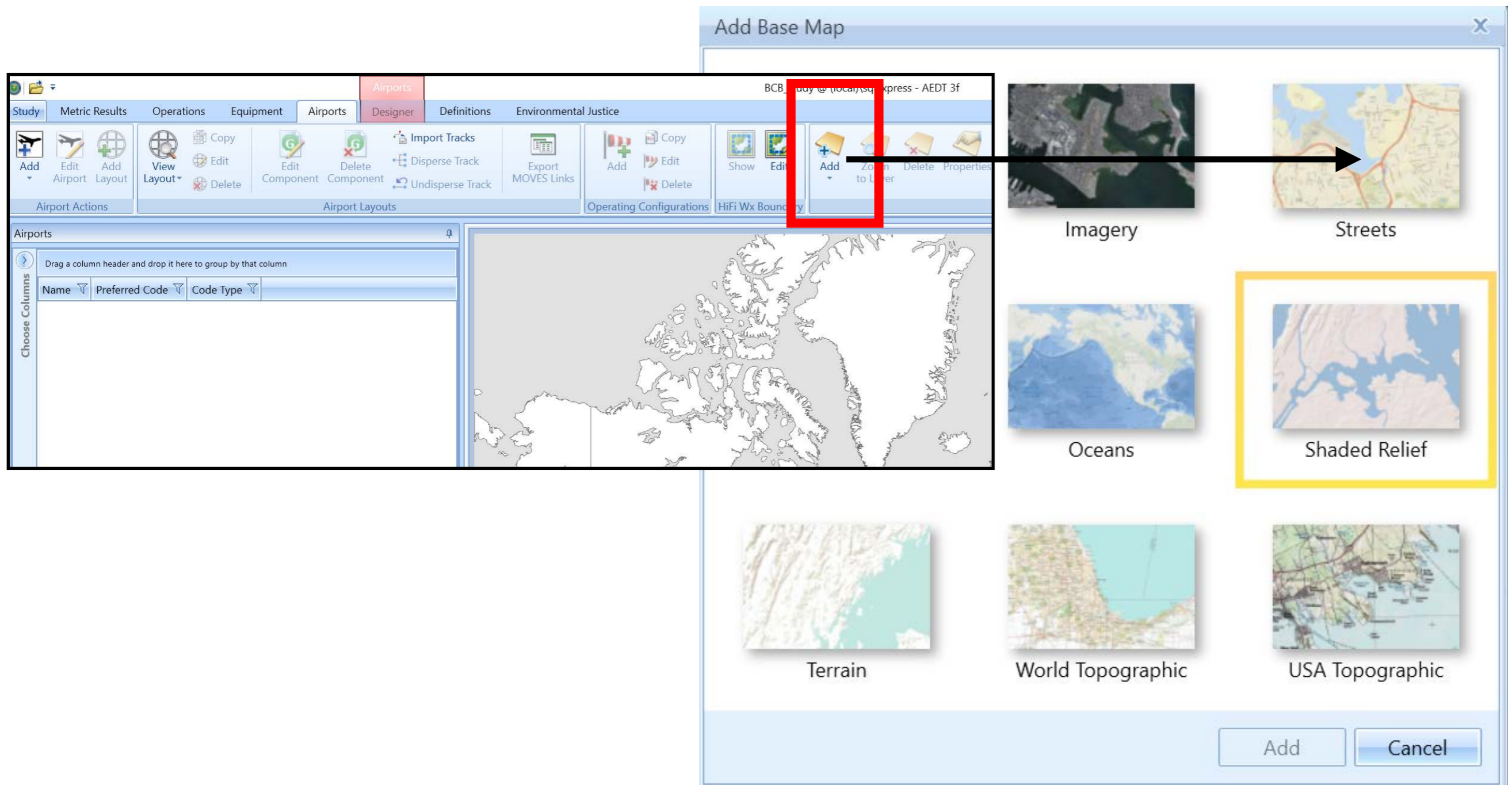
- Layout: KBCB Default Layout 0
- Effective date: 9/10/2020
- Expiration date: 6/6/2079
- Taxi-in time: 6 minutes 6 seconds
- Taxi-out time: 12 minutes 18 seconds

Ground Elements Table:

Type	Name
Runway end	13
Runway end	31
Runway	13 - 31

Add a Base Map

- Adding a base map conveys information about terrain, streets, etc.



BCB Airport with a Base Map

- BCB airport with street map added

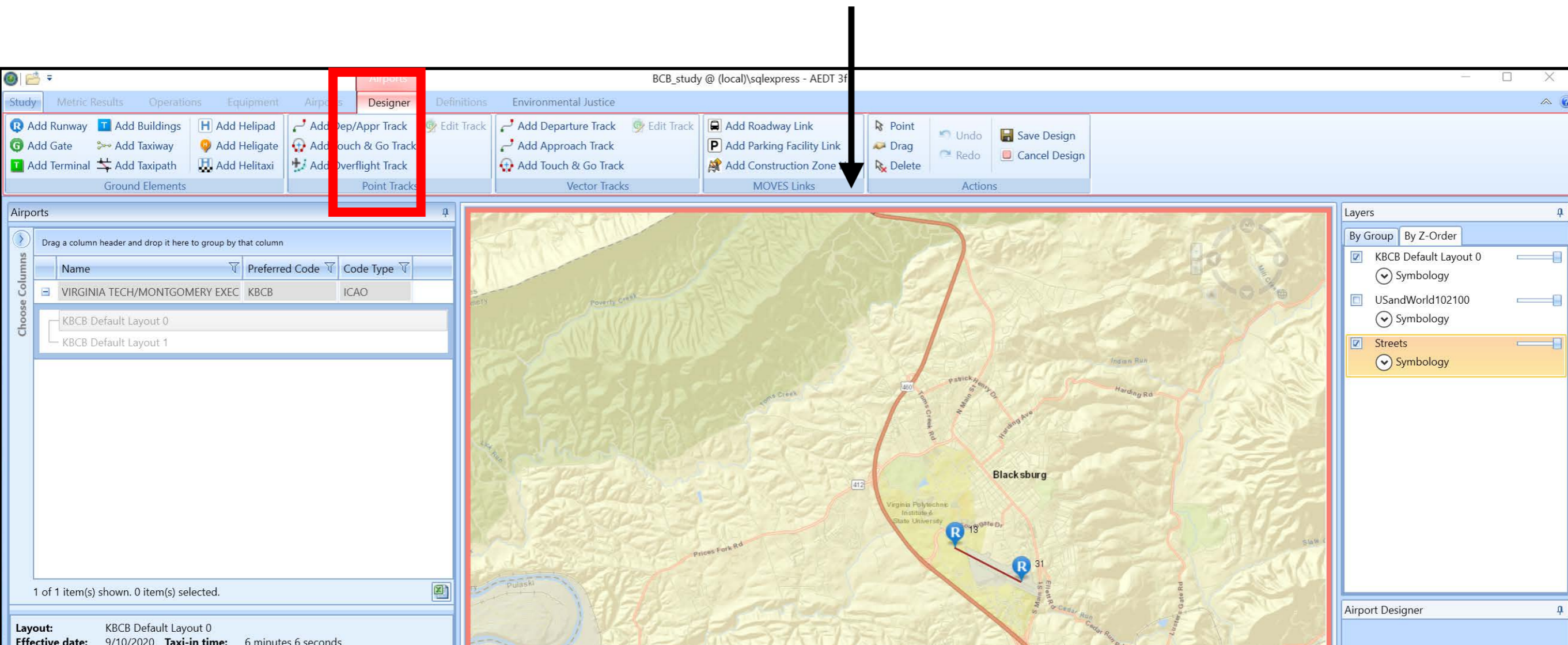
The screenshot displays the BCB Designer software interface. The 'Airports' tab is selected, and the 'Designer' sub-tab is highlighted with a red box. The main map area shows the airport layout overlaid on a street map. The 'Layers' panel on the right shows 'Streets' selected. The 'Airports' table on the left lists 'VIRGINIA TECH/MONTGOMERY EXEC' with preferred code 'KBCB' and code type 'ICAO'.

Name	Preferred Code	Code Type
VIRGINIA TECH/MONTGOMERY EXEC	KBCB	ICAO

Type	Name
Runway end	13
Runway end	31

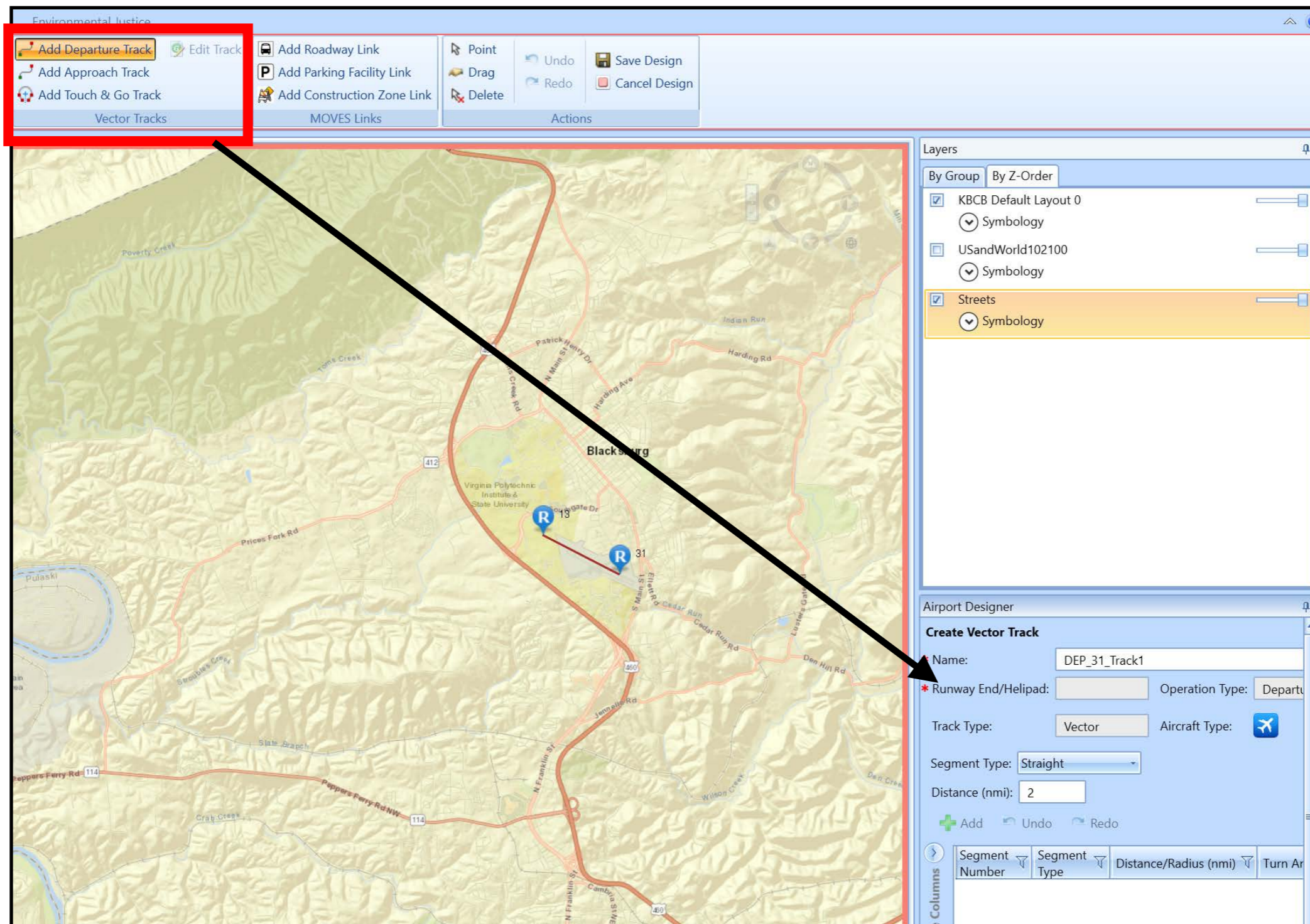
Airport Designer Mode to Add Tracks

- In airport designer mode we can add flight tracks, taxiways, and gates
- Note that the tab below designer mode changes context



Airport Designer Mode: Add Tracks

- AEDT has two types of tracks: vector or point tracks



Multi-segment Departure Track

- I defined a vector track with three segments

The screenshot shows the 'Environmental Justice' software interface. The 'Add Departure Track' button is highlighted in red. The 'Layers' panel on the right shows 'Streets' selected. The 'Airport Designer' panel shows the 'Create Vector Track' configuration for 'DEP1_31_Tracks1'. The track is defined by three segments:

Segment Number	Segment Type	Distance/Radius (nmi)	Turn Angl
0	S	2	
1	R	1.8	102.82118
2	S	10	

A blue callout box with the text 'Make sure to save Your tracks' has two arrows pointing to the 'Save' button and the track configuration table.

One-segment Arrival Track

- I defined a vector track with one segment

The screenshot displays the Airport Designer software interface. A red vector track is shown on a topographic map of Blacksburg, Virginia, extending from the runway area towards the southwest. The 'Add Approach Track' button in the toolbar is highlighted with a red box. A black arrow points from this button to the 'Create Vector Track' configuration panel on the right.

Layers Panel:

- KBCB Default Layout 0
 - Symbology
- USandWorld102100
 - Symbology
- Streets
 - Symbology

Airport Designer Panel - Create Vector Track:

- Name: APP_31_Track1
- Runway End/Helipad: 31 Operation Type: Approach
- Track Type: Vector Aircraft Type:
- Segment Type: Straight Entry Mode: Reverse order
- Distance (nmi): nmi

Segment Table:

Segment Number	Segment Type	Distance/Radius (nmi)	Turn Angl
1	S	8	

1 of 1 item(s) shown. 0 item(s) selected.

Buttons: Save, Cancel

Airport Layout with Tracks

- Verify that all the tracks are good and added to the panel

The screenshot shows the Airport Designer software interface. The main map displays a topographic view of Blacksburg, VA, with several roads and tracks overlaid. The tracks are labeled with names like 'APP_31_Track1' and 'DEP1_31_Tracks1'. The interface includes a top menu bar with options like 'Study', 'Metric Results', 'Operations', 'Equipment', 'Airports', and 'Designer'. A toolbar below the menu bar contains various tools for adding and editing airport elements. On the left, there are panels for 'Airports' and 'Tracks'. The 'Tracks' panel shows a table of track details.

Type	Track	Runway End	Operation Type	Aircraft
Track (Vector)	APP_31_Track1	31	Approach	Fixed
Track (Vector)	DEP1_31_Tracks1	31	Departure	Fixed

The 'Layers' panel on the right shows the following layers:

- KBCB Default Layout 0
 - Symbolology
- USandWorld102100
 - Symbolology
- Streets
 - Symbolology

Airport Layout with Tracks

- Verify that all the tracks are good and added to the panel

BCB_study @ (local)\sqlxpress - AEDT 3f

Save Design
Cancel Design

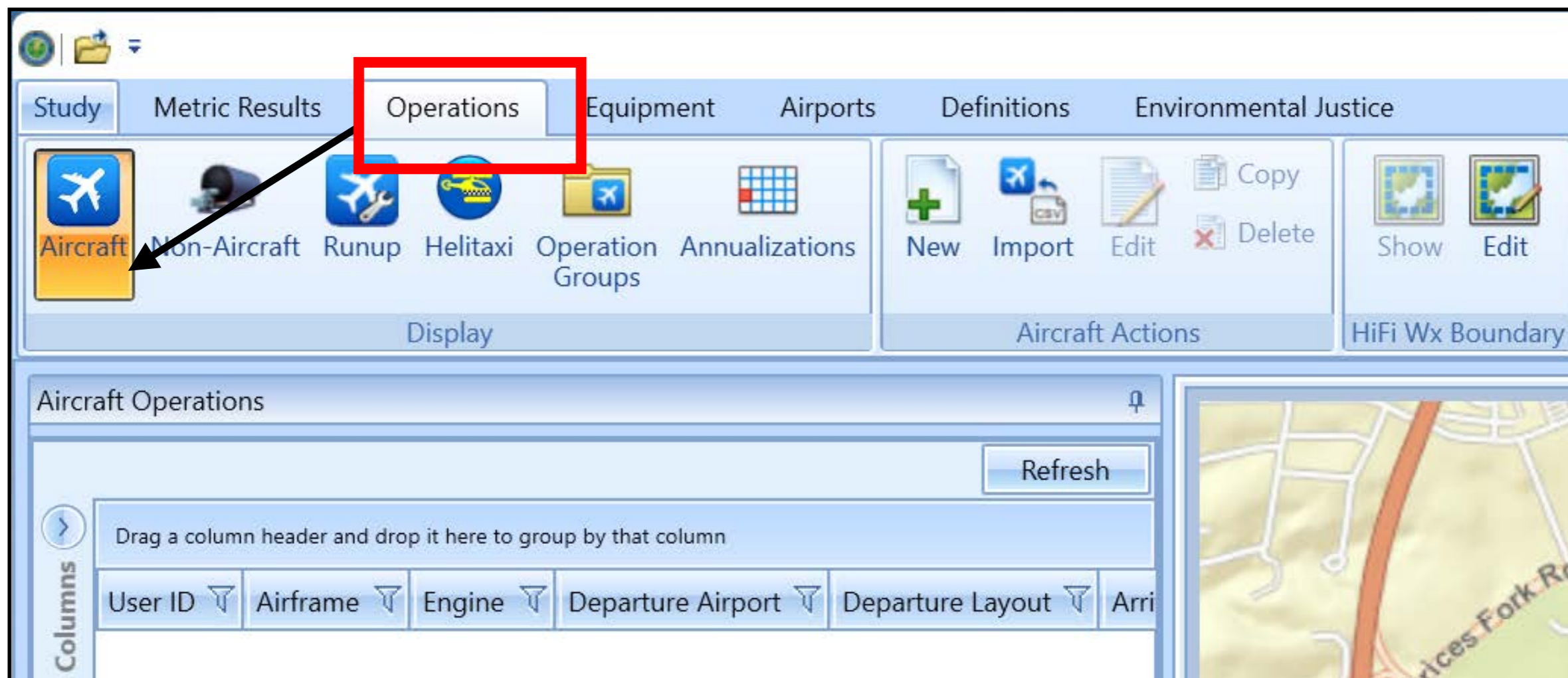
Make sure to save
All your design changes

Name	Preferred Code	Code Type
VIRGINIA TECH/MONTGOMERY EXEC	KBCB	ICAO

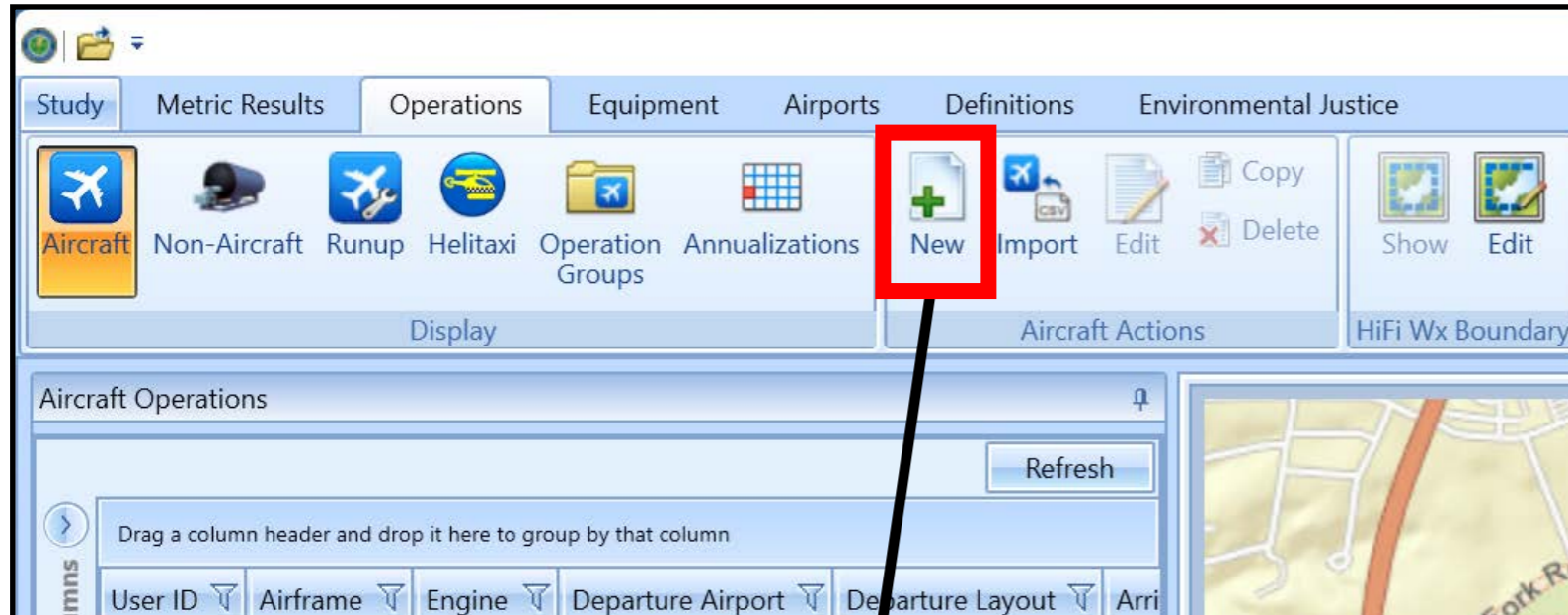
Type	Track	Runway End	Operation Type	Aircr
Track (Vector)	APP_31_Track1	31	Approach	Fixed
Track (Vector)	DEP1_31_Tracks1	31	Departure	Fixed

Airport Operations (Flights)

- Verify that all the tracks are good and added to the panel



Airport Operations (Create Ops)



Create Aircraft Operations

Assign Operation Type and Airport Layout

Use this dialog to create new aircraft operations. Start by selecting operation type and airport layout.

Assign Operation Type and Airport Layout

Choose Equipment
Choose Gate and Enter Taxi Time
Choose GSE/APU
Assign Operation Time
Choose Flight Profile
Choose Track
Summary

Operation type:

Operation count:

Departure airport layout:

Arrival airport layout:

User ID: (optional)

Select airport layout:

Airport	Layout ID	Airport Layout	Effective Date	Expiration Date
VIRGINIA TECH/MONTGOI	1	KBCB Default Layout 0	9/10/2020 12:00:00 AM	6/6/2079 11:59:00 PM
VIRGINIA TECH/MONTGOI	2	KBCB Default Layout 1	1/1/1900 12:00:00 AM	9/9/2020 11:59:00 PM

Airport Operations (Cessna 560XL)

Create Aircraft Operations

Choose Equipment

Select aircraft for new operation(s). Multiple equipment can be selected. A new operation will be created for each equipment-track combination.

Assign Operation Type and Airport Layout

- Choose Equipment**
- Choose Gate and Enter Taxi Time
- Choose GSE/APU
- Assign Operation Time
- Choose Flight Profile
- Choose Track
- Summary

Current Selection

Operation type: Operation count:

Departure airport layout: Arrival airport layout:

User ID:

Choose one or multiple equipment:

Drag a column header and drop it here to group by that column

ANP		Airframe		Engine			
ANP ID	Description	Type	Airframe Model	Count	Code	Model	Manufacturer
CNA560XL	Cessna Citation Excel 560 / PW545A		Cessna 560 Citation Excel	2	PW530	PW530	
CNA560XL	Cessna Citation Excel 560 / PW545A		Cessna 560 Citation XLS	2	PW530	PW530	

Choose Columns

How do I choose equipment?

2 of 3471 item(s) shown. 1 item(s) selected.

Next Cancel

Use Filters if Needed

Airport Ground Operations (Cessna 560XL)

Create Aircraft Operations

Choose GSE/APU

Select Ground Support Equipment (GSE) and/or an Auxiliary Power Unit (APU) for each operation. This step is optional.

Assign Operation Type and Airport Layout
Choose Equipment
Choose Gate and Enter Taxi Time
Choose GSE/APU
Assign Operation Time
Choose Flight Profile
Choose Track
Summary

Current Selection

Operation type: Operation count:

Departure airport layout: Arrival airport layout:

User ID:

Bulk Support Equipment Usage

Use available default APU for all Aircraft
 Use GSE for all Aircraft

Cessna Citation Excel 560 / PW54

Use APU for selected Aircraft
 Use GSE for selected Aircraft

Select GSE (multiple selections are allowed):

Drag a column header and drop it here to group by that column

Selected	ID	Source	GSE Type	Fuel Type	Horsepower	Load Factor	Useful Life
<input type="checkbox"/>	149	Diesel - ACE 802 - Air Conditioner	Air Conditioner	Diesel	300	0.75	13
<input type="checkbox"/>	150	Diesel - ACE 804 - Air Conditioner	Air Conditioner	Diesel	210	0.75	13
<input type="checkbox"/>	151	Diesel - None - Air Conditioner	Air Conditioner	Diesel	0	0.75	13
<input type="checkbox"/>	152	Electric - ACE 802 - Air Conditioner	Air Conditioner	Electric	300	0.75	13
<input type="checkbox"/>	153	Electric - ACE 804 - Air Conditioner	Air Conditioner	Electric	210	0.75	13
<input type="checkbox"/>	154	Electric - None - Air Conditioner	Air Conditioner	Electric	0	0.75	13
<input type="checkbox"/>	155	Diesel - ACE 180 - Air Start	Air Start	Diesel	425	0.9	10

162 of 162 item(s) shown. 3 item(s) selected.

How do I choose APU and GSE?

Next Cancel

Airport Operations Time and Procedures

← Create Aircraft Operations

Assign Operation Time

Assign a specific operation time or operational profiles. This applies to all the operations being created.

Assign Operation Type and Airport Layout
Choose Equipment
Choose Gate and Enter Taxi Time
Choose GSE/APU
Assign Operation Time
Choose Flight Profile
Choose Track
Summary

Current Selection

Operation type: Operation count:

Departure airport layout: Arrival airport layout:

User ID:

Date range of selected airport layout: 9/10/2020 - 6/6/2079

Assign operation time

Operation time:

← Create Aircraft Operations

Choose Flight Profile

Select a flight profile for each operation.

Assign Operation Type and Airport Layout
Choose Equipment
Choose Gate and Enter Taxi Time
Choose GSE/APU
Assign Operation Time
Choose Flight Profile
Choose Track
Summary

Current Selection

Operation type: Operation count:

Departure airport layout: Arrival airport layout:

User ID:

Operation time:

Cessna Citation Excel 560 / PW545A | Cessna 560 Citation Excel | PW530

Choose flight profile:

Drag a column header and drop it here to group by that column

Profile ID	Profile Name	Operation Type	Profile Type	Stage Length	Weight (lbs)	ANP ID	Workflow
2239	STANDARD	Approach	Procedural	1	16830	CNA560XL	ANP Only

Approach Flight Profile

Airport Operations : Track Selection

Create Aircraft Operations

Choose Track

Select track(s). Multiple tracks can be selected. A new operation will be created for each equipment track combination.

Assign Operation Type and Airport Layout
Choose Equipment
Choose Gate and Enter Taxi Time
Choose GSE/APU
Assign Operation Time
Choose Flight Profile
Choose Track
Summary

Current Selection

Operation type: Operation count:
 Departure airport layout: Arrival airport layout:
 User ID:
 Operation time:

Choose one or multiple tracks

Drag a column header and drop it here to group by that column

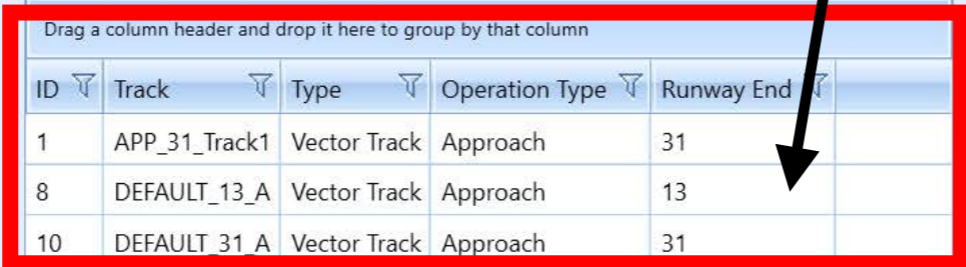
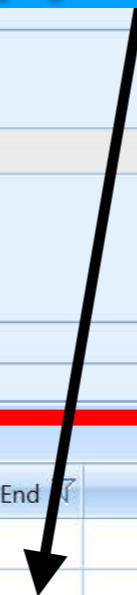
ID	Track	Type	Operation Type	Runway End
1	APP_31_Track1	Vector Track	Approach	31
8	DEFAULT_13_A	Vector Track	Approach	13
10	DEFAULT 31 A	Vector Track	Approach	31

3 of 3 item(s) shown. 0 item(s) selected.

How do I choose tracks?

Next Cancel

Approach Tracks



Airport Operations :Verify Aircraft Operation Data

AEDT default weight based on stage length

Create Aircraft Operations

Summary
Review the new operation parameters that you built.

Assign Operation Type and Airport Layout
Choose Equipment
Choose Gate and Enter Taxi Time
Choose GSE/APU
Assign Operation Time
Choose Flight Profile
Choose Track

Current Selection

Operation type: Operation count:

Departure airport layout: Arrival airport layout:

User ID:

Operation time:

Equipment:

- ▲ Cessna Citation Excel 560 / PW545A | Cessna 560 Citation Excel | PW530
 - ▲ Flight profile: STANDARD Procedural
 - Stage length: 1
 - Initial weight (lbs): 16830

Tracks:

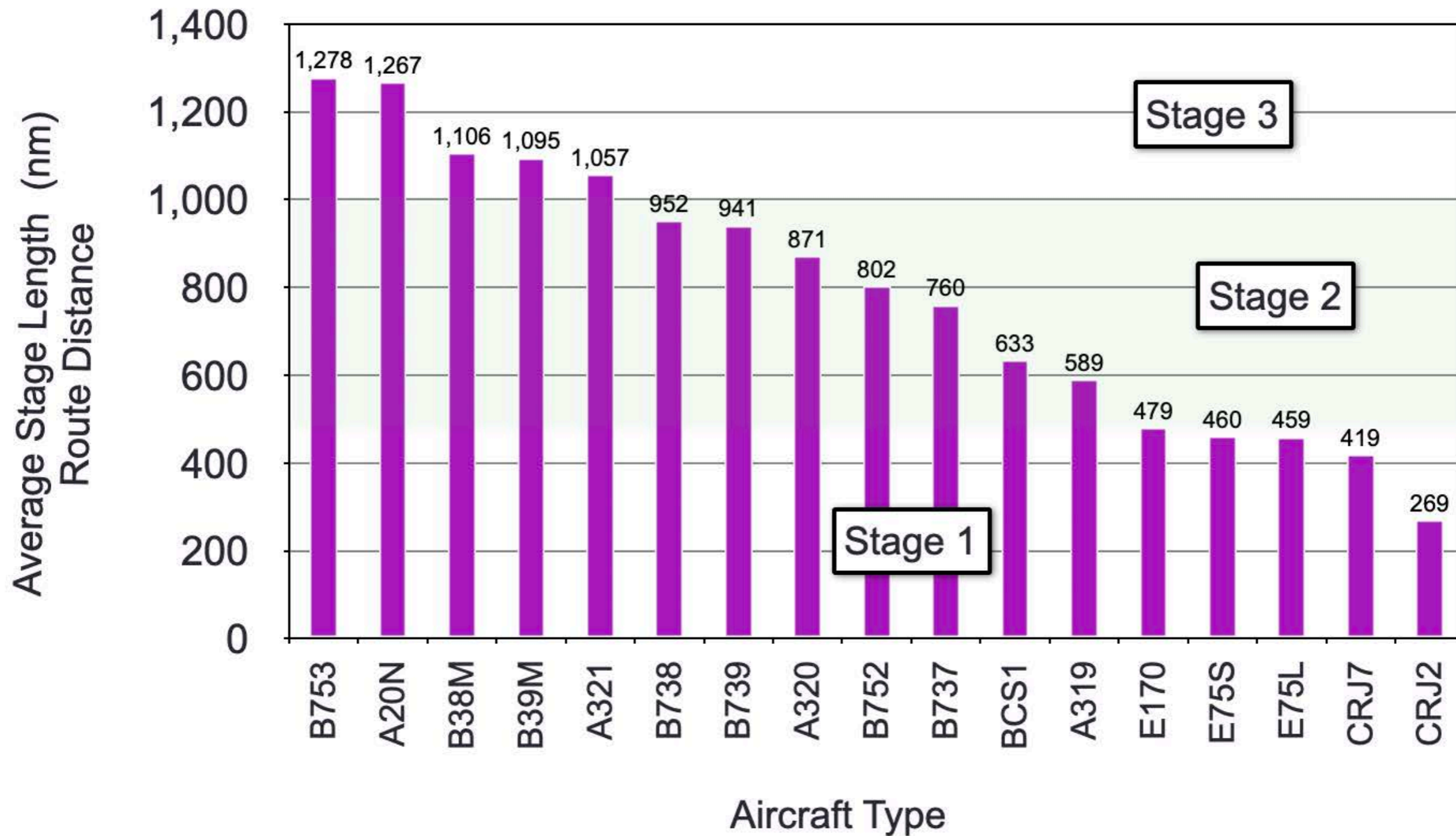
Airport Operations : Aircraft Stage Length

Table 11-30 Departure Takeoff Weights Form

Stage number	Trip length (nmi)	Representative Range
1	0-500	350
2	500-1,000	850
3	1,000-1,500	1,350
4	1,500-2,500	2,200
5	2,500-3,500	3,200
6	3,500-4,500	4,200
7	4,500-5,500	5,200
8	5,500-6,500	6,200
9	6,500-7,500	7,200
10	7,500-8,500	8,200
11	>8,500	
M	Maximum range at MTOW	

Source: AEDT 3f User's Manual

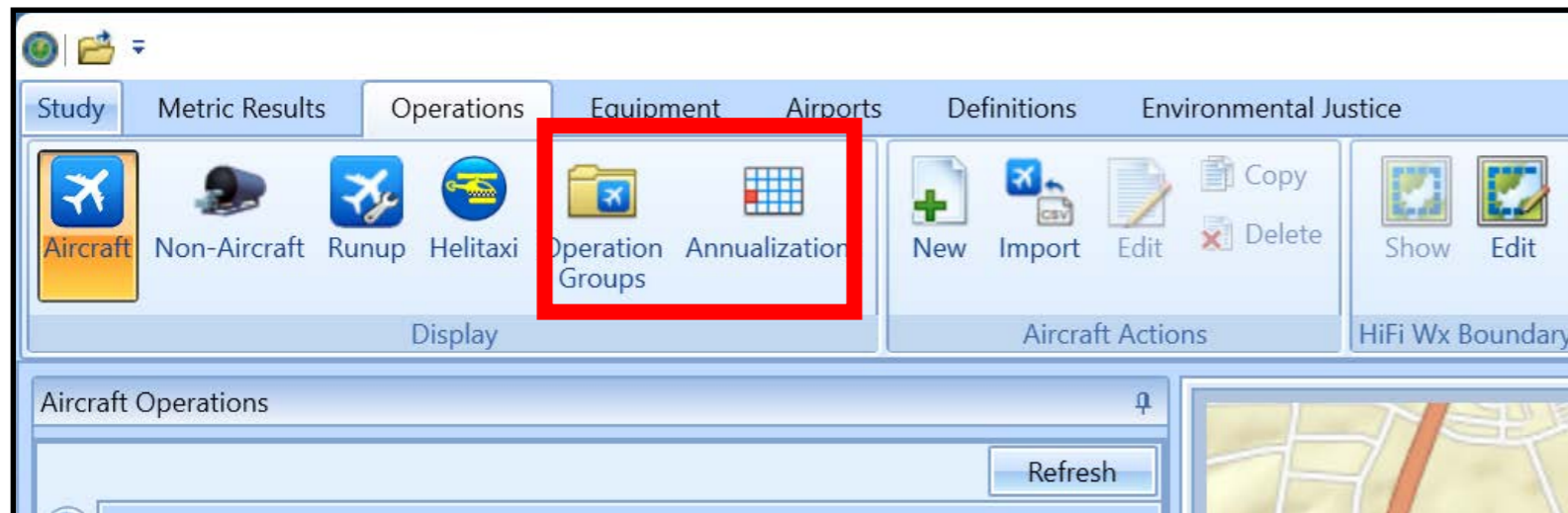
Example Stage Length Analysis



Estimate the distribution of stage lengths flown

Source: Chicago O'Hare Noise Study

Airport Operations : Create Groups of Operations



Columns

← Create Annualization

Assign/Create Operation Groups

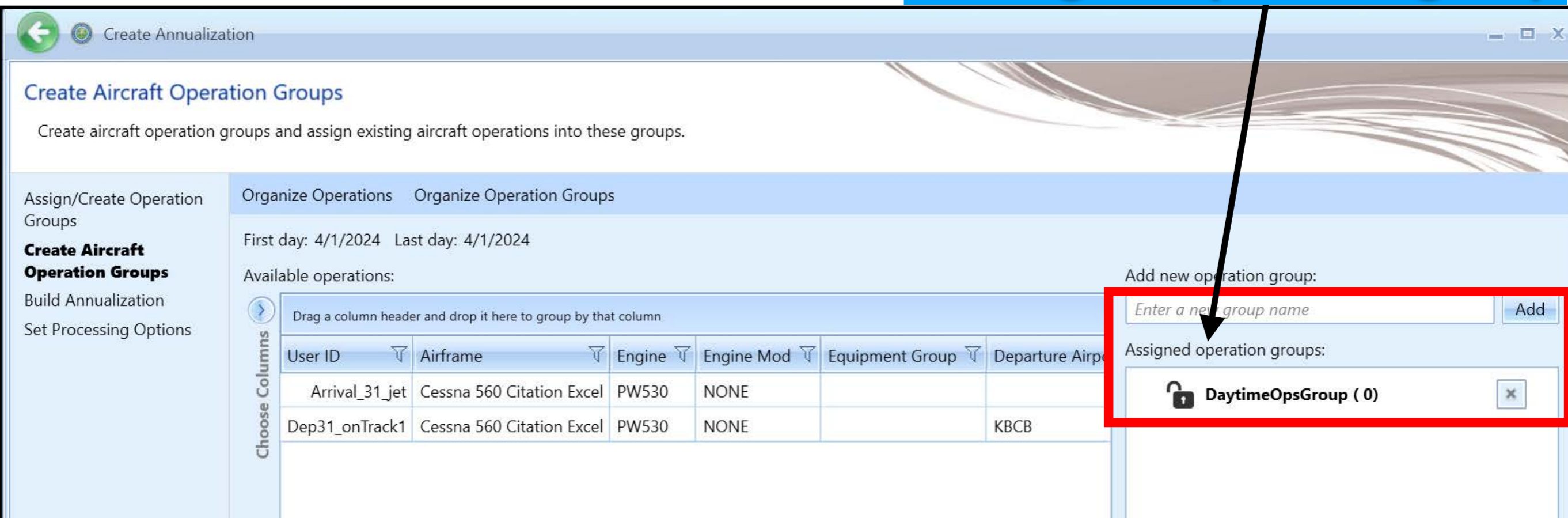
Assign existing operation groups and/or select option(s) to create new operation groups.

<p>Assign/Create Operation Groups</p> <p>Create Aircraft Operation Groups</p> <p>Build Annualization</p> <p>Set Processing Options</p>	<p>Please select at least one option from the list below:</p>	
	<input type="checkbox"/> Assign existing operation group(s)	<p><i>No operation groups found.</i></p>
	<input checked="" type="checkbox"/> Create new aircraft operation group(s)	
	<input type="checkbox"/> Create new non-aircraft operation group(s)	<p><i>No operations found</i></p>
	<input type="checkbox"/> Create new runup operation group(s)	<p><i>No operations found</i></p>

Airport Operations : Create Groups of Operations

- Operations are bundled into groups to be annualized
- Example includes arrival and departure operations from BCB by Cessna 560XL aircraft

Adding an operator group



Create Aircraft Operation Groups
 Create aircraft operation groups and assign existing aircraft operations into these groups.

Assign/Create Operation Groups
Create Aircraft Operation Groups
 Build Annualization
 Set Processing Options

Organize Operations Organize Operation Groups

First day: 4/1/2024 Last day: 4/1/2024

Available operations:

Drag a column header and drop it here to group by that column


User ID	Airframe	Engine	Engine Mod	Equipment Group	Departure Airp
Arrival_31_jet	Cessna 560 Citation Excel	PW530	NONE		
Dep31_onTrack1	Cessna 560 Citation Excel	PW530	NONE		KBCB

Choose Columns

Add new operation group:

Enter a new group name

Assigned operation groups:

 **DaytimeOpsGroup (0)**

Airport Operations :Add Aircraft Operations to a Group

- Operations are on the left panel
- You can drag the operations from the left to the right panel to complete the group

Added the Cessna 560XL Operations to the group

Create Aircraft Operation Groups

Create aircraft operation groups and assign existing aircraft operations into these groups.

Assign/Create Operation Groups

Create Aircraft Operation Groups

Build Annualization

Set Processing Options

Organize Operations Organize Operation Groups

First day: 4/1/2024 Last day: 4/1/2024

Available operations:

Drag a column header and drop it here to group by that column

User ID	Airframe	Engine	Engine Mod	Equipment Group	Departure Airp

Choose Columns

Add new operation group:

Enter a new group name Add

Assigned operation groups:

- DaytimeOpsGroup (2)
 - Cessna 560 Citation Excel PW530
 - Cessna 560 Citation Excel PW530

Airport Annualization

- Groups can be combined to build annualizations
- Example: airport operations operating in a single runway configuration can constitute a group
- Multiple runway configurations can be combined into an annualization

The screenshot shows the 'Create Annualization' interface. At the top, there is a navigation bar with a back arrow and the text 'Create Annualization'. Below this is the main heading 'Build Annualization' with the instruction 'Build annualization tree for the operation groups.' A sidebar on the left contains several menu items: 'Assign/Create Operation Groups', 'Create Aircraft Operation Groups', 'Build Annualization' (highlighted in bold), and 'Set Processing Options'. The main workspace has tabs for 'Organize Operation Groups', 'Organize Annualization', and 'Add Child Group'. It includes input fields for 'First day: 4/1/2024', 'Last day: 4/1/2024', and 'Duration: 1d 00h'. Below these is a 'Defined operation groups:' section with a 'Filter: Enter string' input. A list below shows 'DaytimeOpsGroup'. On the right, an 'Assigned annualization:' section is highlighted with a red border, showing a list item '1 MyOpsGroup'. Two blue callout boxes with arrows point to 'DaytimeOpsGroup' and the 'Assigned annualization' list.

Airport Annualization (2)

- Previously defined operations group (DaytimeOpsGroup) is part of the annualization

Annualization With an Operations Group

Build Annualization
Build annualization tree for the operation groups.

Assign/Create Operation Groups
Create Aircraft Operation Groups
Build Annualization
Set Processing Options

Organize Operation Groups Organize Annualization Add Child Group

First day: 4/1/2024 Last day: 4/1/2024 Duration: 1d 00h

Defined operation groups: Filter: *Enter string*

Assigned annualization:

- 1 MyOpsGroup
 - 1 DaytimeOpsGroup

Processing Options for Annualization

- Accept the default values in this window

← + Create Annualization

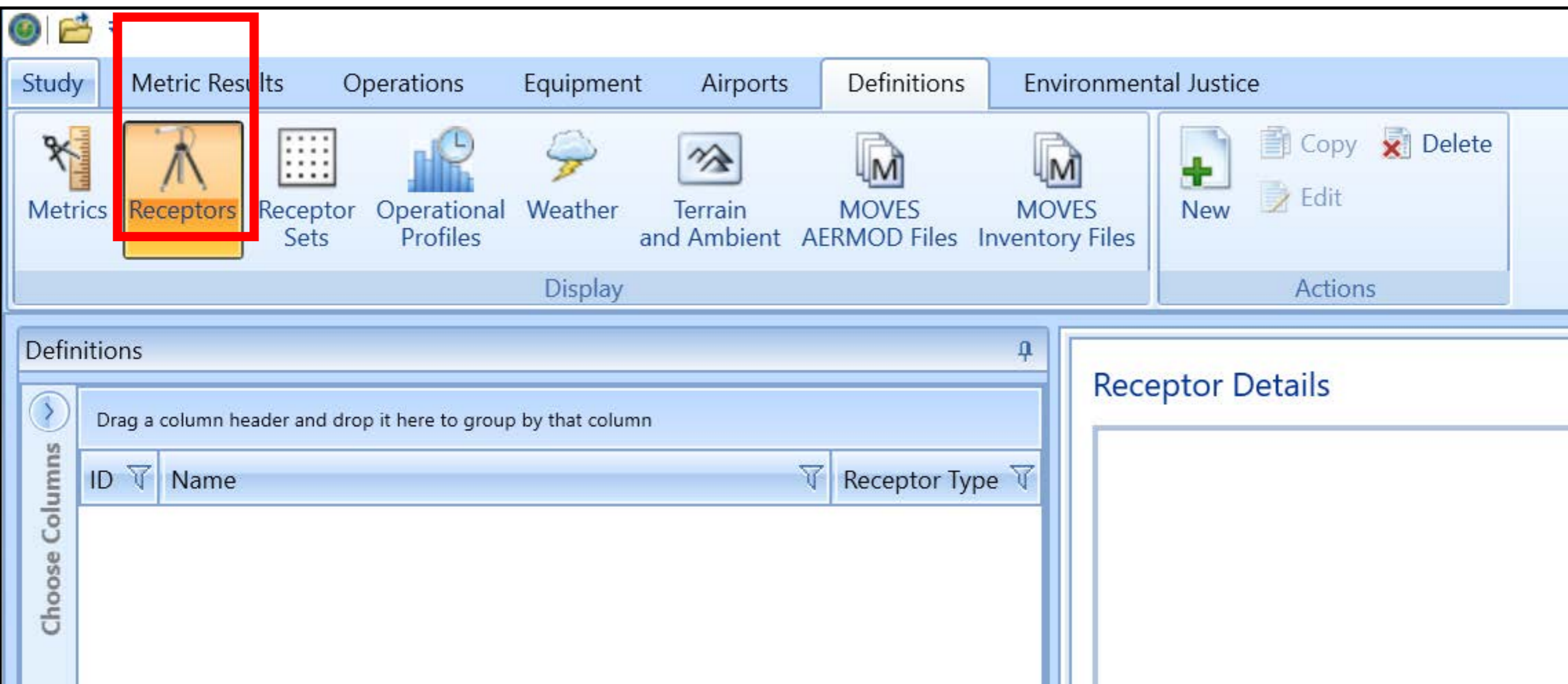
Set Processing Options

If needed, customize processing options for the annualization.

Assign/Create Operation Groups Create Aircraft Operation Groups Build Annualization Set Processing Options	<div style="background-color: #f2f2f2; padding: 5px; border-bottom: 1px solid #ccc;">Metric Result Options (Applies to All Metrics)</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Noise altitude cutoff MSL (ft):</td> <td style="border: 1px solid #ccc; padding: 5px; text-align: center;"><i>Optional double</i></td> </tr> <tr> <td style="padding: 5px;">Mixing height AFE (ft):</td> <td style="border: 1px solid #ccc; padding: 5px; text-align: center;">3000</td> </tr> <tr> <td style="padding: 5px;">Fuel sulfur content (mass fraction):</td> <td style="border: 1px solid #ccc; padding: 5px; text-align: center;">0.00068</td> </tr> <tr> <td style="padding: 5px;">Sulfur to sulfate conversion rate:</td> <td style="border: 1px solid #ccc; padding: 5px; text-align: center;">0.024</td> </tr> </table>	Noise altitude cutoff MSL (ft):	<i>Optional double</i>	Mixing height AFE (ft):	3000	Fuel sulfur content (mass fraction):	0.00068	Sulfur to sulfate conversion rate:	0.024
Noise altitude cutoff MSL (ft):	<i>Optional double</i>								
Mixing height AFE (ft):	3000								
Fuel sulfur content (mass fraction):	0.00068								
Sulfur to sulfate conversion rate:	0.024								

Receptors

- Receptors constitute ground locations where noise and emissions will be evaluated
- Can be a grid or individual locations
- Receptors are created under **Definitions**



The screenshot shows the software interface with the 'Definitions' tab selected. The 'Receptors' icon, which depicts a tripod, is highlighted with a red rectangular box. Below the ribbon, the 'Definitions' panel is visible, containing a table with columns for 'ID', 'Name', and 'Receptor Type'. A 'Choose Columns' sidebar is on the left, and a 'Receptor Details' panel is on the right.

ID	Name	Receptor Type
Drag a column header and drop it here to group by that column		

Receptor Information

- Try to use small spacing to improve the resolution of the noise contours

200 receptors at 0.05 nm spacing covers 10 nm

Grid origin can be automatically set by AEDT

Receptor Details

General Info

Name:

Type:

Units:

X count:

Y count:

X spacing (nmi):

Y spacing (nmi):

Grid Origin Info

The location of the bottom-left corner of the grid with respect to the X-Y origin.

X offset (nmi):

Y offset (nmi):

Location Info

The X-Y Projection Origin in Lat/Lon. Usually set to the airport origin.

Latitude (deg):

Longitude (deg):

Elevation MSL (ft):

Receptor Sets Information

- At least one receptor set is needed in your study
- Example, one receptor for noise, one for emissions

The screenshot shows the software interface with the 'Receptor Sets' tool selected in the 'Definitions' tab. The 'Receptor Set Details' dialog box is open, showing the following information:

Receptor set: BCBReceptorSet
 Receptor set description: Enter description
 Receptor set type: Receptor
 Type:
 Receptor total:
 Point total:
 Bounding box:

Dynamic grid

Available receptors:

ID	Name	Receptor Type	Latitude (deg)	Longitude (deg)
1	BCB_receptor	Grid	37.2093866667	-80.41209

Assigned receptors:

ID	Name	Receptor Type	Latitude (deg)	Longitude (deg)
----	------	---------------	----------------	-----------------

1 of 1 item(s) shown. 0 item(s) selected. 0 of 0 item(s) shown. 0 item(s) selected.

Receptor Sets Information

- Drag the receptor from the left panel to the right to create a receptor set

Receptor Set Details

Receptor set:

Receptor set description:

Receptor set type: Receptor
Type:
Receptor total:
Point total:
Bounding box:

Dynamic grid

Available receptors:

ID	Name	Receptor Type	Latitude (deg)	Longitude (deg)
1	BCB_receptor	Grid	37.2093866667	-80.41209

1 of 1 item(s) shown. 0 item(s) selected.

Assigned receptors:

ID	Name	Receptor Type	Latitude (deg)	Longitude (deg)
----	------	---------------	----------------	-----------------

0 of 0 item(s) shown. 0 item(s) selected.

Receptor Set Details

Receptor set:

Receptor set description:

Receptor set type: Receptor
Type:
Receptor total:
Point total:
Bounding box:

Dynamic grid

Available receptors:

ID	Name	Receptor Type	Latitude (deg)	Longitude (deg)
----	------	---------------	----------------	-----------------

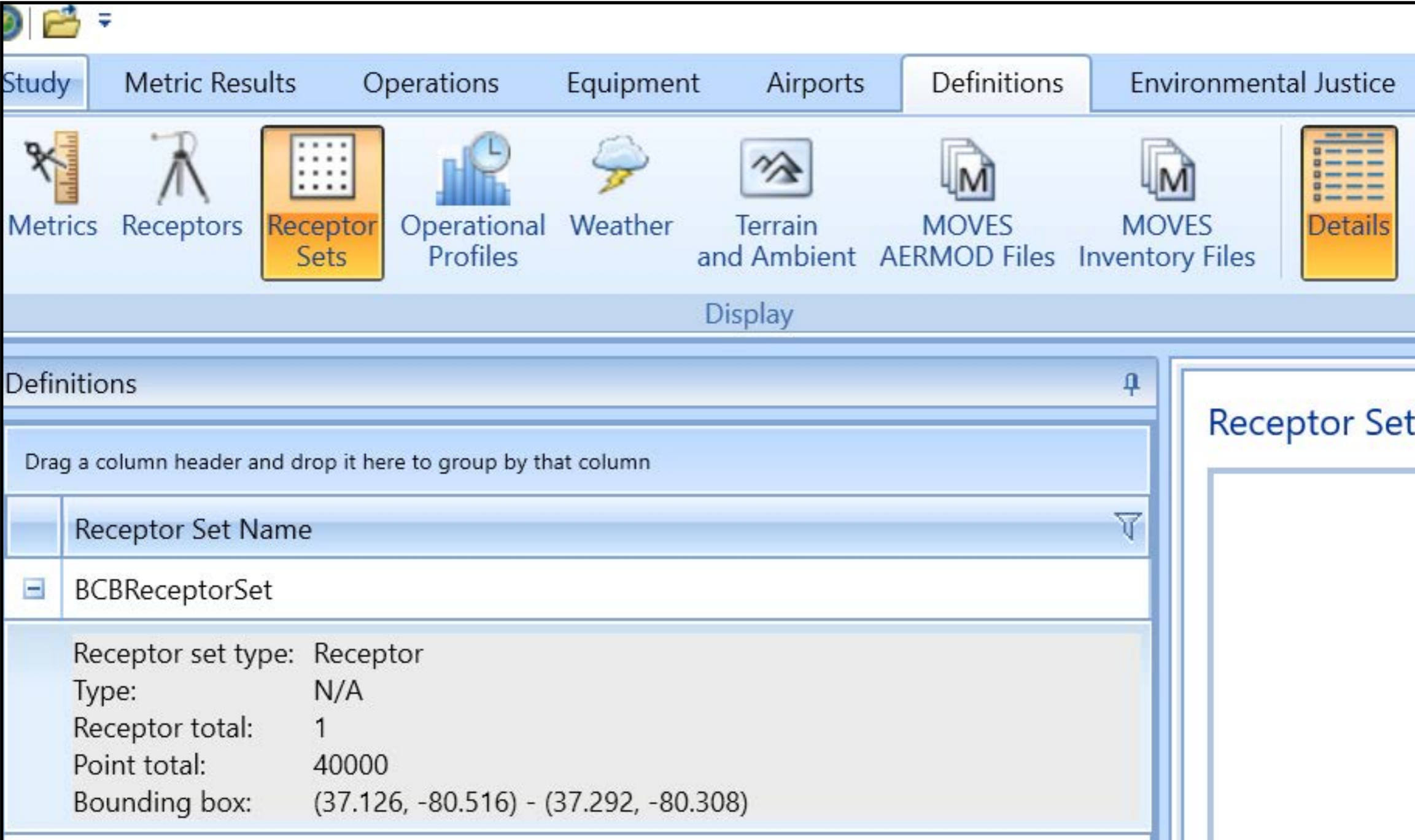
Assigned receptors:

ID	Name	Receptor Type	Latitude (deg)	Longitude (deg)
1	BCB_receptor	Grid	37.2093866667	-80.41209

Created receptor set

Receptor Set Details

- The receptor has 40,000 data point in the grid (200 x 200 data points)



The screenshot shows a software interface with a top navigation bar containing tabs: Study, Metric Results, Operations, Equipment, Airports, Definitions, and Environmental Justice. Below the tabs is a toolbar with icons for Metrics, Receptors, Receptor Sets (highlighted), Operational Profiles, Weather, Terrain and Ambient, MOVES AERMOD Files, MOVES Inventory Files, and Details (highlighted). A 'Display' button is located below the toolbar.

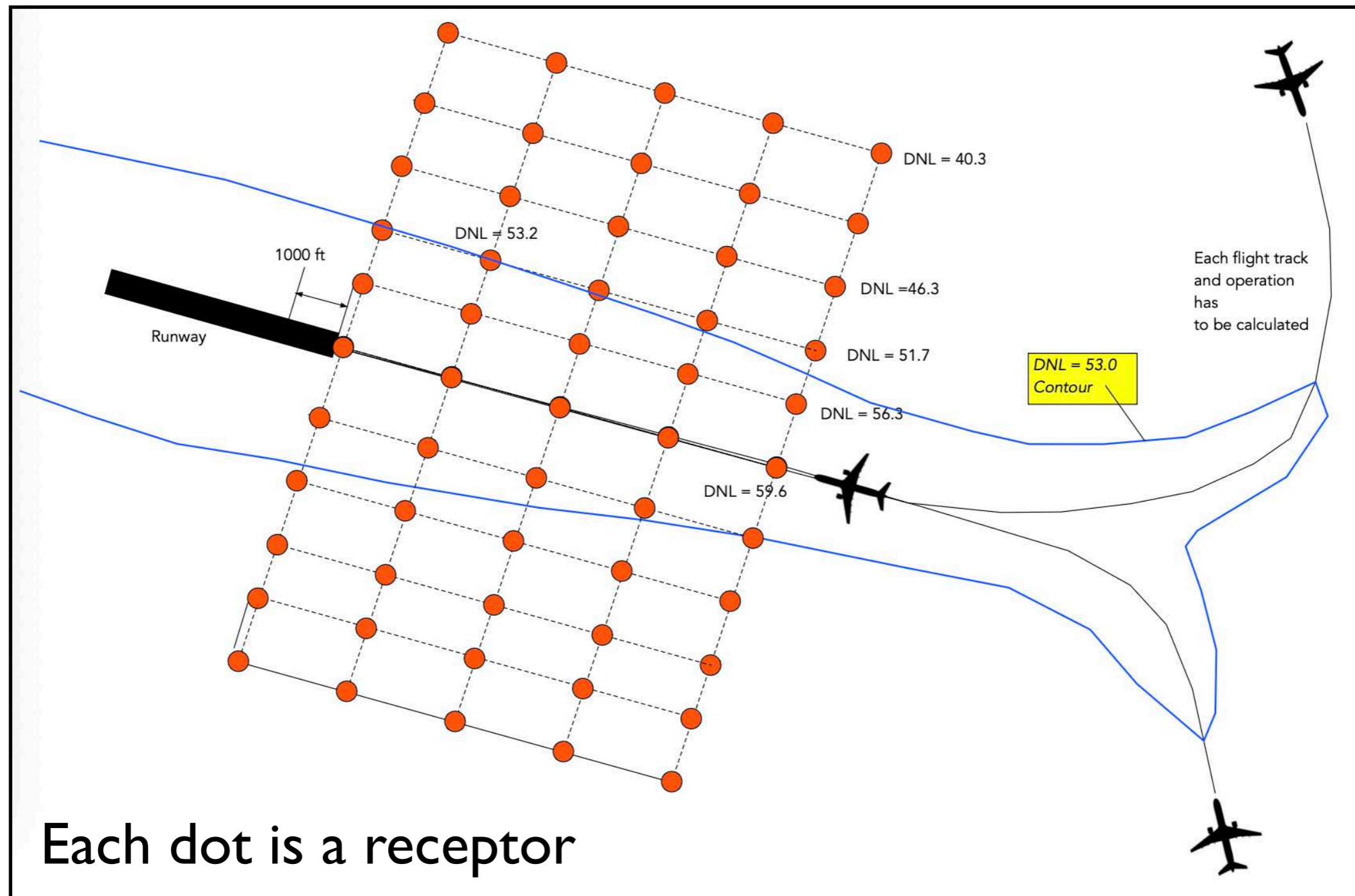
The main window is titled 'Definitions' and contains a table with the following data:

Definitions	
Drag a column header and drop it here to group by that column	
	Receptor Set Name
<input checked="" type="checkbox"/>	BCBReceptorSet
Receptor set type:	Receptor
Type:	N/A
Receptor total:	1
Point total:	40000
Bounding box:	(37.126, -80.516) - (37.292, -80.308)

On the right side of the interface, a panel titled 'Receptor Set' is partially visible.

Receptor Set Details

- The receptor has 40,000 data point in the grid (200 x 200 data points)



Metrics for a Study

- AEDT has more than 12 noise metrics
- Metrics are reviewed under the **Study tab**

The screenshot shows the AEDT software interface. The 'Study' tab is selected in the top menu. The 'Metrics' icon in the toolbar is highlighted with a red box. A blue callout box with white text points to the 'Metrics' icon, stating: "Database of metrics contains the weights associated with each operation".

The 'Definitions' pane on the left shows a table of metrics. The 'DNL' metric is selected and highlighted in yellow.

Metric Name	Metric Type	User Defined
CDNL	Noise	No
CEXP	Noise	No
CNEL	Noise	No
DNL	Noise	No
EPNL	Noise	No
LAEQ	Noise	No
LAEQD	Noise	No
LAEQN	Noise	No
LAMAX	Noise	No
LCMAX	Noise	No
NEF	Noise	No
PNLTM	Noise	No

The configuration window for the 'DNL' metric is shown on the right. It includes the following fields:

- Metric name: DNL
- Metric kind: Noise
- Metric type: Exposure
- User defined: No
- Frequency type: A-Weight

The 'Time and Weight' section is expanded, showing the following configuration:

	Weight	Start Time	End Time
Day:	1	07:00:00	18:59:59
Evening:	1	19:00:00	21:59:59
Night:	10	22:00:00	06:59:59

Additional options include:

- Time-averaging constant
- Decibels: 49.37

Create a Metric for the Study

- Create a metric for the study
- Metrics are created under **Metrics Results**

The screenshot displays a software interface for creating a metric. The 'Metric Results' tab is active, and the 'Define' button is highlighted with a red box. A blue callout box with an arrow points to the 'Define' button, containing the text 'Define the metric Result'. Below the toolbar is a table with columns: ID, State, Metric, Type, Receptor Set, Annualization, Name. To the right is a map showing a road labeled 'Prices F' and 'Oak Ln'.

ID	State	Metric	Type	Receptor Set	Annualization	Name
Drag a column header and drop it here to group by that column						

Select a Metric for the Study

- Selecting a metric for the study involves dragging the available metric row (left panel) to the right panel

Drag the noise metric From the left panel to The right panel

The screenshot shows a software interface titled "Define Metric Results" with a "Choose Metrics" section. On the left, there are navigation options: "Choose Receptor Sets", "Select Annualization", "Set Processing Options", and "Summary". The main area is divided into "Available metrics:" and "Selected:". The "Available metrics:" table lists various noise metrics, with "DNL" selected. The "Selected:" table shows "DNL" has been moved to the right panel.

Metric Name	Metric Type	User Defined
CDNL	Noise	No
CEXP	Noise	No
CNEL	Noise	No
EPNL	Noise	No
LAEQ	Noise	No
LAEQD	Noise	No
DNL	Noise	No

Steps needed to define a Noise metric In your study

Select a Receptor Set to Estimate the Metric in the Study

- Remember that multiple receptor sets may be available

Drag the receptor set
From the left panel to
The right panel

Define Metric Results

Choose Receptor Sets

Select existing receptor sets for the study.

Choose Metrics

- Choose Receptor Sets**
- Select Annualization
- Set Processing Options
- Summary

Available receptor sets:

Receptor Set Name
BCBReceptorSet

Selected:

Receptor Set Name

Select the Annualization to Estimate the Metric in the Study

- Select the annualization associated with the metric in your study

← 🌐 Define Metric Results

Select Annualization

Select an annualization to use for the metric results.

Choose Metrics

Choose Receptor Sets

Select Annualization

Set Processing Options

Summary

Available annualizations:

Drag a column header and drop it here to group by that column

Name	Start Time	Duration
MyOpsGroup	4/1/2024 12:00:00 AM	1d 00h

Annualization details:

- 1 MyOpsGroup
 - 1 DaytimeOpsGroup

Select the Processing Options to Estimate the Metric in the Study

- Default options are generally OK
- You can specify the aircraft performance options

Define Metric Results

Set Processing Options
If needed, customize processing options for metric results.

Choose Metrics
Choose Receptor Sets
Select Annualization
Set Processing Options
Summary

Metric	Type	Receptor Set
DNL	Noise	BCBReceptorSet

Result Storage Options

Noise:

Emissions:

Emissions/Performance Modeling Options

Weather Fidelity

Aircraft Performance Model Options

Check track angle

Apply delay & sequencing model

Calculate aircraft engine startup emissions

Analysis year:

Noise Modeling Options

Use hard ground attenuation for helicopters & propeller aircraft

Atmospheric absorption type:

Metric Result Options

Name:

Description:

Terrain

Use terrain data

Apply line of sight blockage

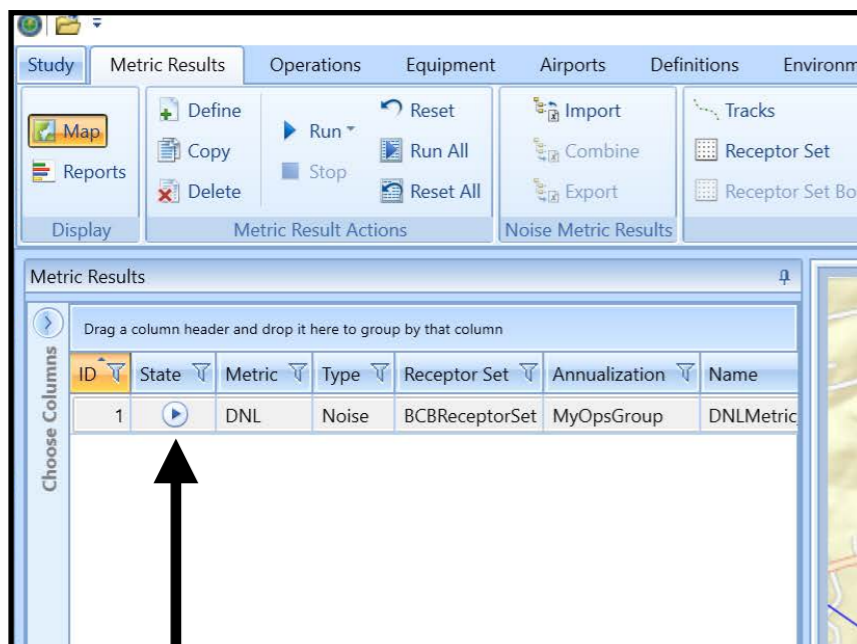
Fill terrain MSL (ft):

Callouts:

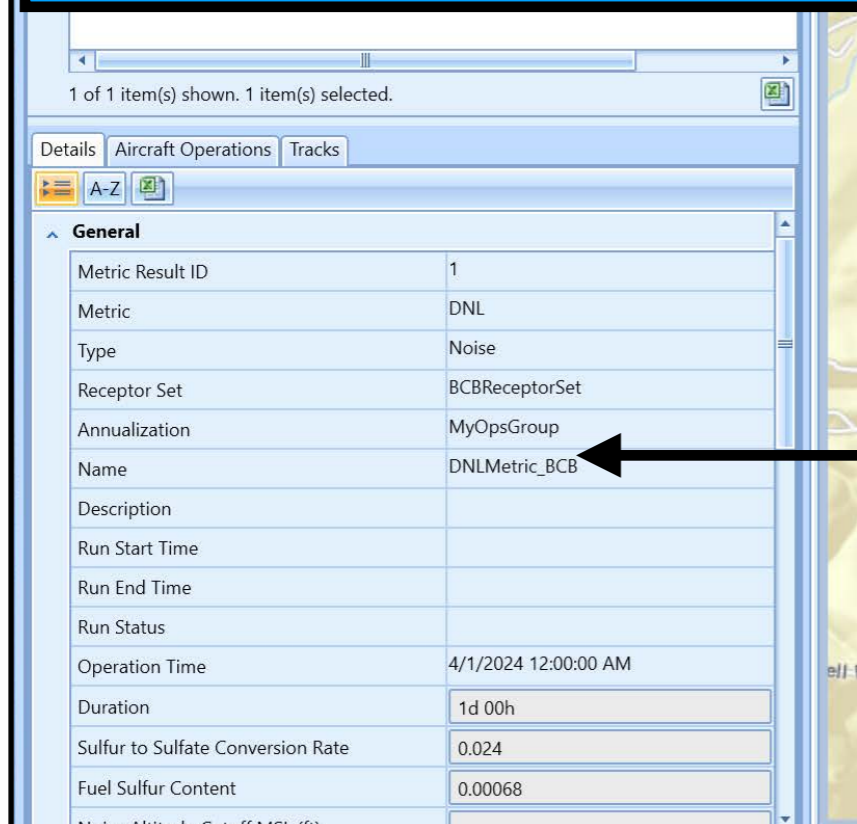
- Name the metric result To identify the outputs
- You can add terrain Analysis if hills and valleys May block/magnify the noise Level

Summary Page of Metric in the Study

- A summary window presents all options selected in the study



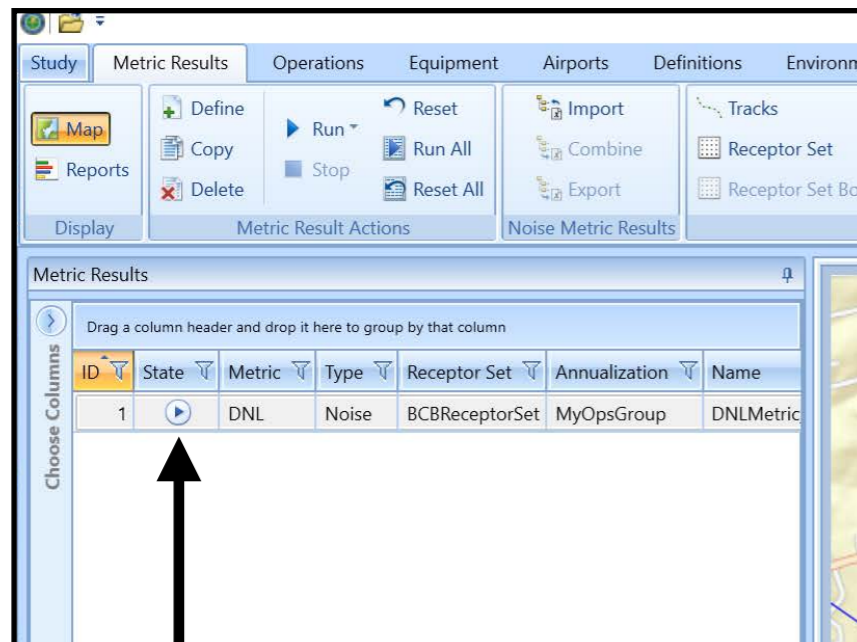
You can run the analysis
Here



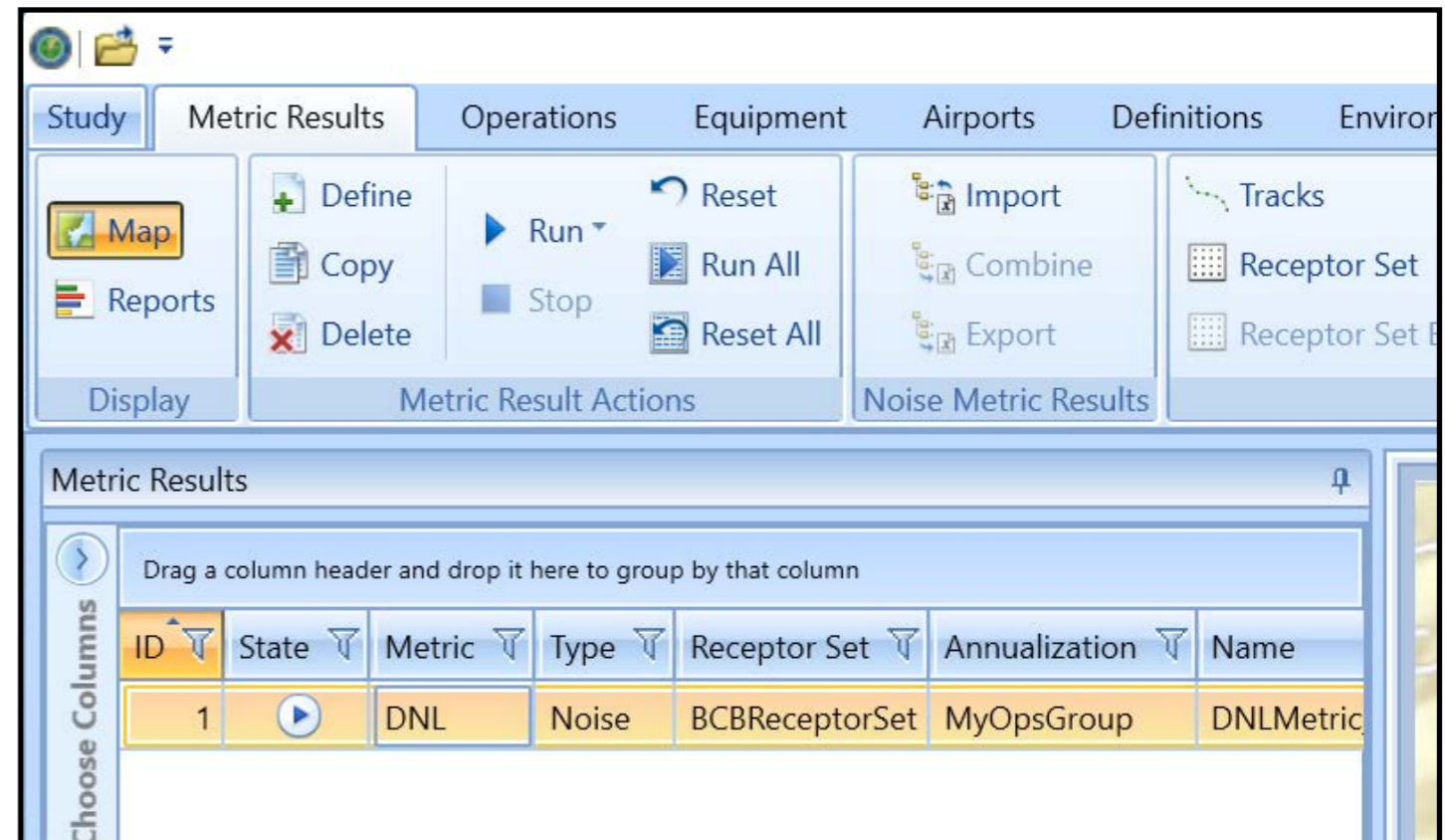
Review all your options

Summary Page of Metric in the Study

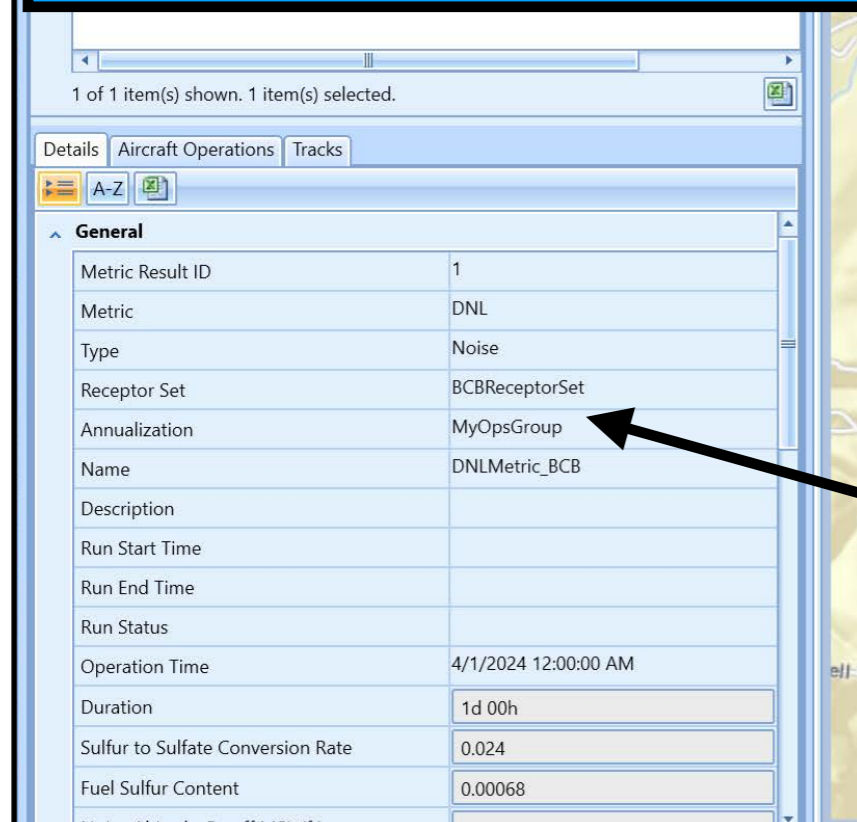
- A summary window presents all options selected in the study



You can run the analysis Here



Review all your options



Metric Task Completed

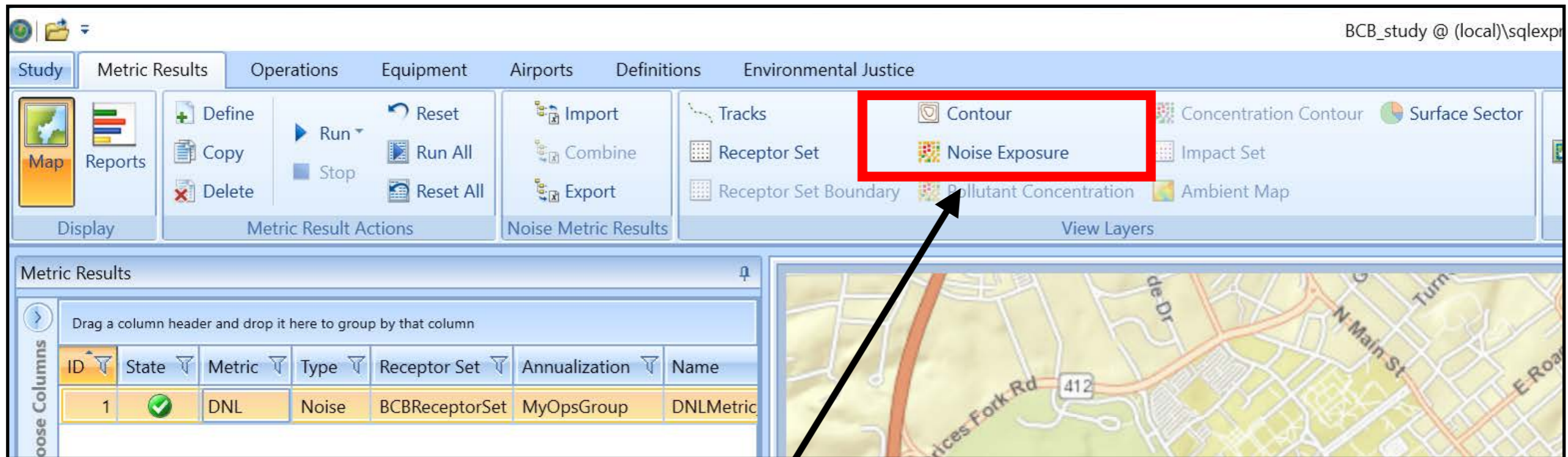
- Run times of a metric study can take from a couple of minutes to hours depending on the complexity of the study

The screenshot shows a software interface with a 'Metric Results' window. The window contains a table with the following columns: ID, State, Metric, Type, Receptor Set, Annualization, and Name. The first row of data is highlighted in yellow and contains the values: 1, a green checkmark, DNL, Noise, BCBReceptorSet, MyOpsGroup, and DNLMetric. A blue callout box with white text points to the green checkmark, stating 'Indicates the metric task is complete'.

ID	State	Metric	Type	Receptor Set	Annualization	Name
1	✓	DNL	Noise	BCBReceptorSet	MyOpsGroup	DNLMetric

Creating Noise Contours

- Noise contours or exposure maps can be created for the study metric completed
- Maps are discrete values of noise levels
- Contours are interpolated values of equal noise levels



Creates contours or exposure maps

Creating Noise Contours

- Contours are interpolated values of equal noise levels

Contour Settings

Minimum:

Maximum:

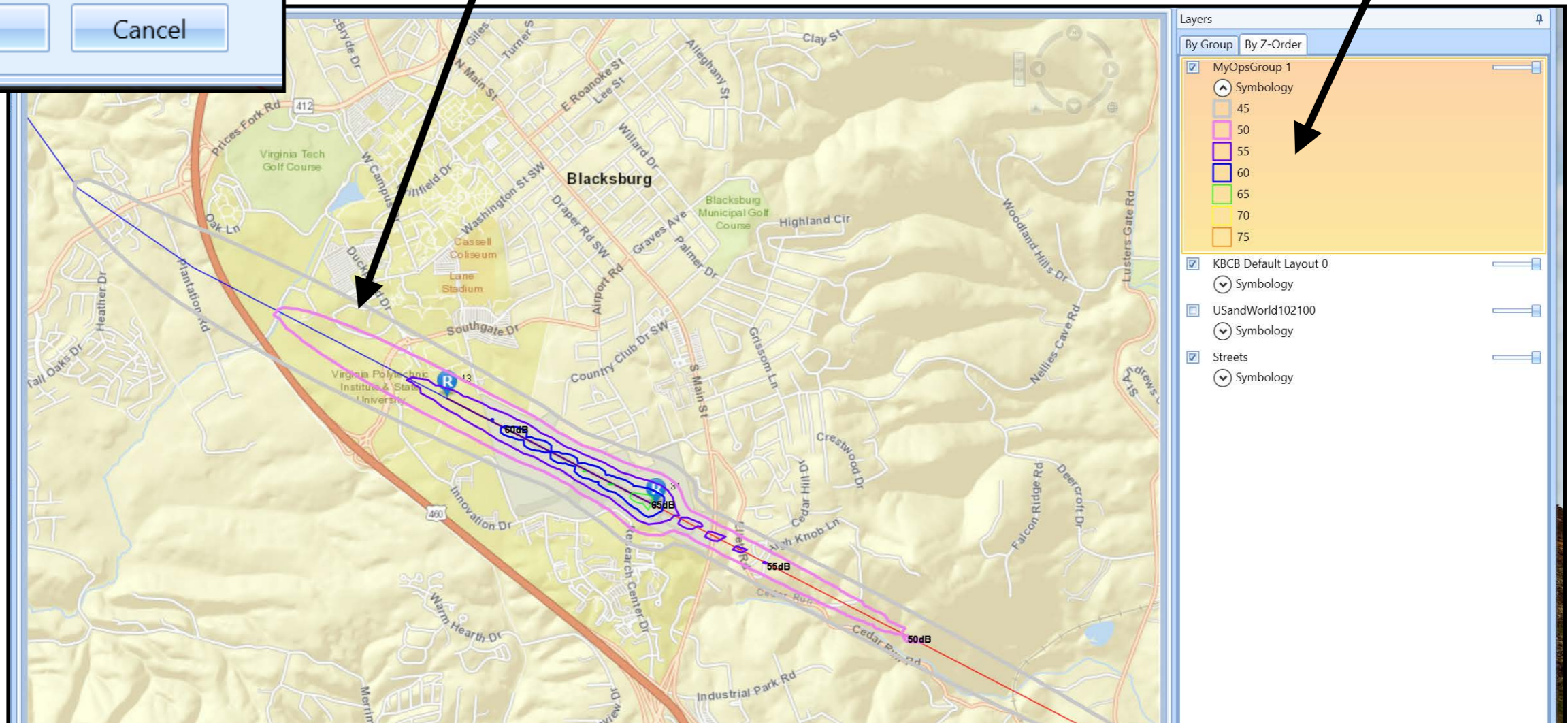
Increment:

Make these settings the defaults

OK Cancel

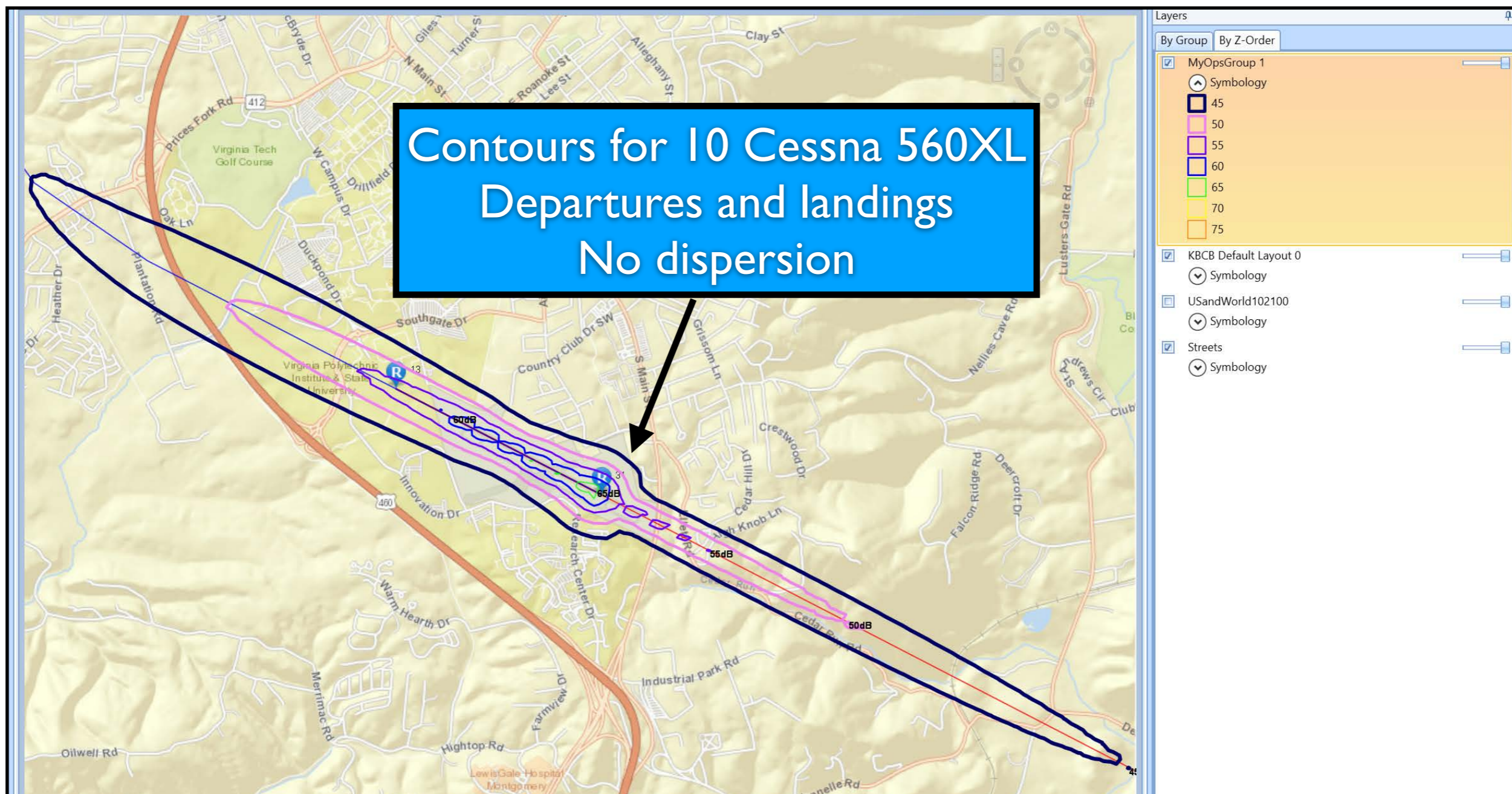
Noise contours for the BCB study

Attributes of The noise contour Layer



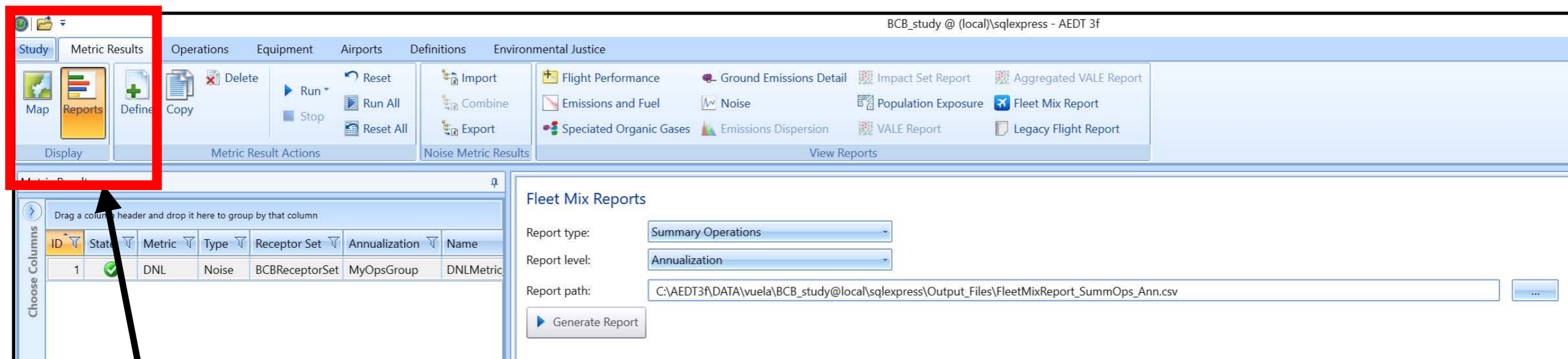
Noise Contours

- Noise contours can be exported as shapefiles (used in many other applications)
- You can change the properties of the contours



AEDT Reports

- Flight performance
- Emissions and fuel consumption
- Organic gases
- Ground emissions (requires Ground service equipment)
- Population exposure
- Fleet mix report



Access to various reports

AEDT Reports: Emissions

- Creates summary or detailed report of fuel and emissions
- Can select by operations group
- Can change the units of the report

Creates emissions report

Summary information

The screenshot displays the AEDT software interface. The 'View Reports' pane is open, showing various report options. The 'Emissions and Fuel' report is highlighted with a red box. Below this, the 'Emissions Report 1' configuration is shown, including 'Operation Group: All Operation Groups', 'Group by: Annualized Operation Group Summary', and 'Units: Grams'. A 'Generate Report' button is visible. To the right, the 'Browse Open Reports' pane shows a list of reports with 'Emissions Report 1' selected, also highlighted with a red box. The main data table is titled 'Emissions' and contains the following data:

Operation Group	Mode	Fuel (g)	Distance (km)	Duration	CO (g)	THC (g)	TOG (g)	VOC (g)	NMHC (g)	NOx (g)	SOx
DaytimeOpsGroup	Taxi Out	3.5438E+005	0.0000E+000	00:12:18.000	4.0478E+004	2.5900E+004	3.0042E+004	2.9886E+004	3.0042E+004	5.0035E+002	4.7039
DaytimeOpsGroup	Climb Ground	4.2598E+005	7.6300E+000	00:12:37.840	4.0989E+004	2.6028E+004	3.0095E+004	2.9938E+004	3.0095E+004	1.2595E+003	5.6543
DaytimeOpsGroup	Climb Below 1000 ft AFE	4.7892E+005	1.8900E+001	00:12:51.960	4.1368E+004	2.6062E+004	3.0134E+004	2.9977E+004	3.0134E+004	1.8214E+003	6.3569
DaytimeOpsGroup	Climb Below Mixing Height (3000 ft AFE)	7.5521E+005	9.6390E+001	00:14:17.250	4.3389E+004	2.6242E+004	3.0342E+004	3.0184E+004	3.0342E+004	4.4383E+003	1.0024
DaytimeOpsGroup	Climb Below 10000 ft AFE	1.4662E+006	5.2393E+002	00:19:40.020	5.0536E+004	2.6780E+004	3.0964E+004	3.0802E+004	3.0964E+004	9.0865E+003	1.9461
DaytimeOpsGroup	Above 10000 ft AFE	0.0000E+000	0.0000E+000	00:00:00.000	0.0000E+000	0.0000E+000	0.0000E+000	0.0000E+000	0.0000E+000	0.0000E+000	0.0000
DaytimeOpsGroup	Descend Below 10000 ft AFE	7.8370E+005	3.5919E+002	00:13:49.170	3.6859E+004	1.5409E+004	1.7816E+004	1.7723E+004	1.7816E+004	2.7074E+003	1.0403
DaytimeOpsGroup	Descend Below Mixing Height (3000 ft AFE)	5.7625E+005	1.8447E+002	00:11:07.170	3.1048E+004	1.4561E+004	1.6836E+004	1.6749E+004	1.6836E+004	1.8652E+003	7.6489
DaytimeOpsGroup	Descend Below 1000 ft AFE	3.4937E+005	6.7990E+001	00:08:11.710	2.4580E+004	1.3567E+004	1.5687E+004	1.5605E+004	1.5687E+004	1.4935E+003	1.4935
DaytimeOpsGroup	Descend Ground	2.1922E+005	9.7500E+000	00:06:31.660	2.0870E+004	1.2985E+004	1.5014E+004	1.4935E+004	1.5014E+004	1.4935E+003	1.4935
DaytimeOpsGroup	Taxi In	1.7575E+005	0.0000E+000	00:06:06.000	2.0074E+004	1.2886E+004	1.4899E+004	1.4821E+004	1.4899E+004	1.4821E+003	1.4821
DaytimeOpsGroup	Full Flight	2.2499E+006	8.8312E+002	00:33:29.190	8.7395E+004	4.2189E+004	4.8780E+004	4.8526E+004	4.8780E+004	4.8526E+003	4.8526

Browse reports

AEDT Reports: Emissions Report

- Note the report starts /ends at the 10,000 feet mixing layer
- Taxi-in, Taxi-out, Climb, Descend phases included

The screenshot displays the AEDT software interface. The top menu bar includes 'Study', 'Metric Results', 'Operations', 'Equipment', 'Airports', 'Definitions', and 'Environmental Justice'. The toolbar contains icons for 'Map', 'Reports', 'Define', 'Copy', 'Delete', 'Run', 'Reset', 'Run All', 'Stop', 'Reset All', 'Import', 'Combine', 'Export', and 'View Reports'. The 'View Reports' section includes options like 'Flight Performance', 'Ground Emissions Detail', 'Impact Set Report', 'Aggregated VALE Report', 'Emissions and Fuel', 'Noise', 'Population Exposure', 'Fleet Mix Report', 'Speciated Organic Gases', 'Emissions Dispersion', 'VALE Report', and 'Legacy Flight Report'.

The 'Metric Results' window on the left shows a table with columns: ID, State, Metric, Type, Receptor Set, Annualization, and Name. A single row is visible with ID 1, State checked, Metric DNL, Type Noise, Receptor Set BCBReceptorSet, Annualization MyOpsGroup, and Name DNLMetric.

The 'Emissions Report 1' window on the right shows the following configuration:

- Operation Group: All Operation Groups
- Group by: Annualized Operation Group Summary
- Units: Grams
- Generate Report button

The 'Emissions' table below shows the following data:

Operation Group	Mode	Fuel (g)	Distance (km)	Duration	CO (g)	THC (g)	TOG (g)	VOC (g)	NMHC
DaytimeOpsGroup	Taxi Out	3.5438E+005	0.0000E+000	00:12:18.000	4.0478E+004	2.5983E+004	3.0042E+004	2.9886E+004	3.00
DaytimeOpsGroup	Climb Ground	4.2598E+005	7.6300E+000	00:12:37.840	4.0989E+004	2.6028E+004	3.0095E+004	2.9938E+004	3.00
DaytimeOpsGroup	Climb Below 1000 ft AFE	4.7892E+005	1.8900E+001	00:12:51.960	4.1368E+004	2.6062E+004	3.0134E+004	2.9977E+004	3.01
DaytimeOpsGroup	Climb Below Mixing Height (3000 ft AFE)	7.5521E+005	9.6390E+001	00:14:17.250	4.3389E+004	2.6242E+004	3.0342E+004	3.0184E+004	3.03
DaytimeOpsGroup	Climb Below 10000 ft AFE	1.4662E+006	5.2393E+002	00:19:40.020	5.0536E+004	2.6780E+004	3.0964E+004	3.0802E+004	3.09
DaytimeOpsGroup	Above 10000 ft AFE	0.0000E+000	0.0000E+000	00:00:00.000	0.0000E+000	0.0000E+000	0.0000E+000	0.0000E+000	0.00
DaytimeOpsGroup	Descend Below 10000 ft AFE	7.8370E+005	3.5919E+002	00:13:49.170	3.6859E+004	1.5409E+004	1.7816E+004	1.7723E+004	1.78
DaytimeOpsGroup	Descend Below Mixing Height (3000 ft AFE)	5.7625E+005	1.8447E+002	00:11:07.170	3.1048E+004	1.4561E+004	1.6836E+004	1.6749E+004	1.68
DaytimeOpsGroup	Descend Below 1000 ft AFE	3.4937E+005	6.7990E+001	00:08:11.710	2.4580E+004	1.3567E+004	1.5687E+004	1.5605E+004	1.56
DaytimeOpsGroup	Descend Ground	2.1922E+005	9.7500E+000	00:06:31.660	2.0870E+004	1.2985E+004	1.5014E+004	1.4935E+004	1.50
DaytimeOpsGroup	Taxi In	1.7575E+005	0.0000E+000	00:06:06.000	2.0074E+004	1.2886E+004	1.4899E+004	1.4821E+004	1.48
DaytimeOpsGroup	Full Flight	2.2499E+006	8.8312E+002	00:33:29.190	8.7395E+004	4.2189E+004	4.8780E+004	4.8526E+004	4.87

AEDT Reports: Flight Performance

- Review the departure and approach profiles modeled in AEDT

The screenshot displays the AEDT software interface. The top menu bar includes options like 'Study', 'Metric Results', 'Operations', 'Equipment', 'Airports', 'Definitions', and 'Environmental Justice'. Below this, there are various report generation buttons such as 'Flight Performance', 'Ground Emissions Detail', 'Impact Set Report', 'Aggregated VALE Report', 'Emissions and Fuel', 'Noise', 'Population Exposure', 'Fleet Mix Report', 'Speciated Organic Gases', 'Emissions Dispersion', 'VALE Report', and 'Legacy Flight Report'.

The main window is divided into several panes. On the left, the 'Metric Results' pane shows a table with columns for 'ID', 'State', 'Metric', 'Type', 'Receptor Set', 'Annualization', and 'Name'. A blue callout box with the text 'Select the Track' points to the 'Track' column header in this table.

The central pane, titled 'Flight Performance Report 1', has two tabs: 'Flight Operations' and 'Flight Segments'. The 'Flight Operations' tab is active, showing a table with columns: 'User ID', 'Operation ID', 'Event ID', 'Track', 'Aircraft Code', 'Aircraft Type', 'Operation Type', 'Operation Count', 'Flight Trajectory Type', and 'Profile Name'. A red box highlights this table. Below the table, a blue callout box contains the text 'Cumulative ground track Departure track for Cessna 560XL'.

At the bottom of the interface, the 'Details' pane shows 'Aircraft Operations' and 'Tracks' tabs. The 'Tracks' tab is active, displaying a graph of 'Altitude AFE [feet]' versus 'Cumulative Ground Track Distance [Feet]'. The graph shows a red line representing the flight profile, starting at 0 feet altitude and increasing to approximately 10,000 feet at a distance of 180,000 feet. A red box highlights the graph area. Below the graph, the 'Axis Setting' section shows 'X axis: Cumulative Ground Track Distance', 'Y axis: Altitude AFE', 'X unit: Feet', and 'Y unit: Feet'.

AEDT Reports: Flight Performance

- Approach profile for Cessna 560XL

The screenshot displays the AEDT software interface with the following components:

- Metric Results Table:**

ID	State	Metric	Type	Receptor Set	Annualization	Name
1	✓	DNL	Noise	BCBReceptorSet	MyOpsGroup	DNLMetric
- Flight Performance Report 1 Table:**

User ID	Operation ID	Event ID	Track	Aircraft Code	Aircraft Type	Operation Type	Operation Count	Flight Trajectory Type	Profile Name
Dep31_onTrack1	2	100001	DEP1_31_Tracks1	CNA560XL	Fixed Wing	Departure	10	Procedural	STANDARD
Arrival_31_jet	1	100000	DEFAULT_31_A	CNA560XL	Fixed Wing	Arrival	10	Procedural	STANDARD
- Graph:** A line graph showing the cumulative ground track distance (X-axis, 0 to 120,000 feet) versus altitude above field elevation (Y-axis, -700 to 7,000 feet). A red line represents the approach profile for the Cessna 560XL, starting at approximately 6,300 feet at 0 feet distance and decreasing to near 0 feet at 115,000 feet distance. A legend indicates the red line corresponds to event ID 100000.
- Annotations:**
 - A blue box with the text "Select the Track" has an arrow pointing to the "Track" column header in the Flight Performance Report table.
 - A blue box with the text "Cumulative ground track Approach Track for Cessna 560XL" has an arrow pointing to the red line on the graph.

AEDT Reports: Noise Exposure Report

- Detailed report of noise metric at each receptor
- 40,000 receptors in our simple BCB analysis
- DNL reported at each receptor

Cumulative ground track
Approach Track for Cessna 560XL

The screenshot displays the AEDT software interface. The main window shows a 'Noise Exposure Report 1' table. The table has the following columns: Noise Result Index, Latitude (deg), Longitude (deg), Elevation MSL (ft), Noise Level (dB), Metric Type, Metric Name, Receptor ID, and Receptor Name. The data rows show noise levels ranging from -5.44 dB to -3.78 dB for various receptors. A blue callout box with an arrow points to the 'Metric Name' column, which contains 'DNL' for all entries.

Noise Result Index	Latitude (deg)	Longitude (deg)	Elevation MSL (ft)	Noise Level (dB)	Metric Type	Metric Name	Receptor ID	Receptor Name
1	37.126321	-80.515773	2132	-5.44	Exposure	DNL	1	BCB_receptor
2	37.126322	-80.514731	2132	-5.32	Exposure	DNL	1	BCB_receptor
3	37.126323	-80.513689	2132	-5.21	Exposure	DNL	1	BCB_receptor
4	37.126324	-80.512647	2132	-5.09	Exposure	DNL	1	BCB_receptor
5	37.126325	-80.511605	2132	-4.98	Exposure	DNL	1	BCB_receptor
6	37.126326	-80.510563	2132	-4.87	Exposure	DNL	1	BCB_receptor
7	37.126326	-80.509521	2132	-4.75	Exposure	DNL	1	BCB_receptor
8	37.126327	-80.508479	2132	-4.64	Exposure	DNL	1	BCB_receptor
9	37.126328	-80.507437	2132	-4.53	Exposure	DNL	1	BCB_receptor
10	37.126329	-80.506394	2132	-4.42	Exposure	DNL	1	BCB_receptor
11	37.126330	-80.505352	2132	-4.30	Exposure	DNL	1	BCB_receptor
12	37.126331	-80.504310	2132	-4.19	Exposure	DNL	1	BCB_receptor
13	37.126331	-80.503268	2132	-4.08	Exposure	DNL	1	BCB_receptor
14	37.126332	-80.502226	2132	-3.97	Exposure	DNL	1	BCB_receptor
15	37.126333	-80.501184	2132	-3.88	Exposure	DNL	1	BCB_receptor

AEDT Reports: Noise Exposure Report

- Detailed report of noise metric at each receptor
- 40,000 receptors in our simple BCB analysis
- DNL reported at each receptor

Cumulative ground track
Approach Track for Cessna 560XL

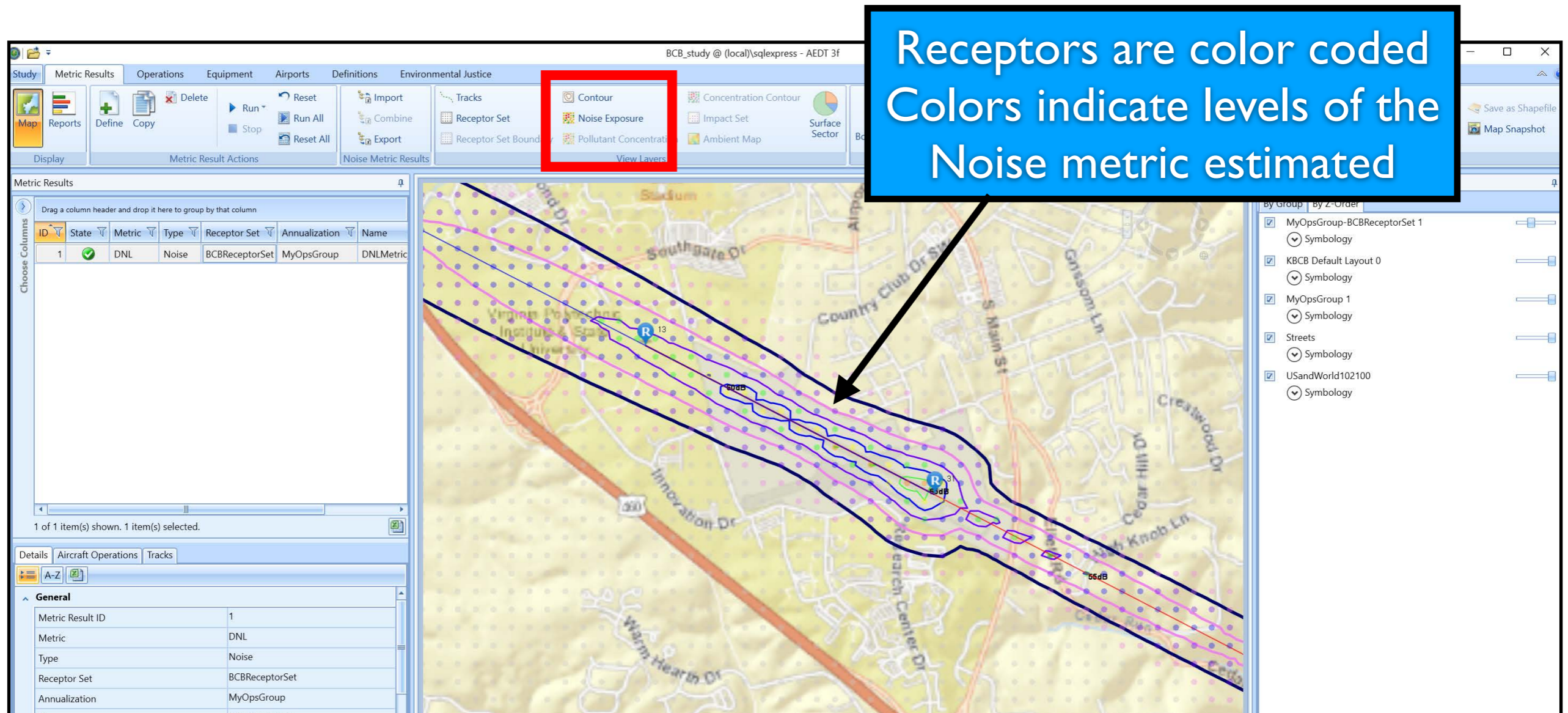
The screenshot displays the AEDT software interface. The main window shows a 'Noise Exposure Report 1' table with the following data:

Noise Result Index	Latitude (deg)	Longitude (deg)	Elevation MSL (ft)	Noise Level (dB)	Metric Type	Metric Name	Receptor ID	Receptor Name	Rec
1	37.126321	-80.515773	2132	-5.44	Exposure	DNL	1	BCB_receptor	1
2	37.126322	-80.514731	2132	-5.32	Exposure	DNL	1	BCB_receptor	1
3	37.126323	-80.513689	2132	-5.21	Exposure	DNL	1	BCB_receptor	1
4	37.126324	-80.512647	2132	-5.09	Exposure	DNL	1	BCB_receptor	1
5	37.126325	-80.511605	2132	-4.98	Exposure	DNL	1	BCB_receptor	1
6	37.126326	-80.510563	2132	-4.87	Exposure	DNL	1	BCB_receptor	1
7	37.126326	-80.509521	2132	-4.75	Exposure	DNL	1	BCB_receptor	1
8	37.126327	-80.508479	2132	-4.64	Exposure	DNL	1	BCB_receptor	1
9	37.126328	-80.507437	2132	-4.53	Exposure	DNL	1	BCB_receptor	1
10	37.126329	-80.506394	2132	-4.42	Exposure	DNL	1	BCB_receptor	1
11	37.126330	-80.505352	2132	-4.30	Exposure	DNL	1	BCB_receptor	1
12	37.126331	-80.504310	2132	-4.19	Exposure	DNL	1	BCB_receptor	1
13	37.126331	-80.503268	2132	-4.08	Exposure	DNL	1	BCB_receptor	1
14	37.126332	-80.502226	2132	-3.97	Exposure	DNL	1	BCB_receptor	1
15	37.126333	-80.501184	2132	-3.88	Exposure	DNL	1	BCB_receptor	1

The interface also includes a 'Metric Results' panel on the left and a 'Browse Open Reports' panel on the right, which lists 'Emissions Report 1', 'Flight Performance Report 1', and 'Noise Exposure Report 1'.

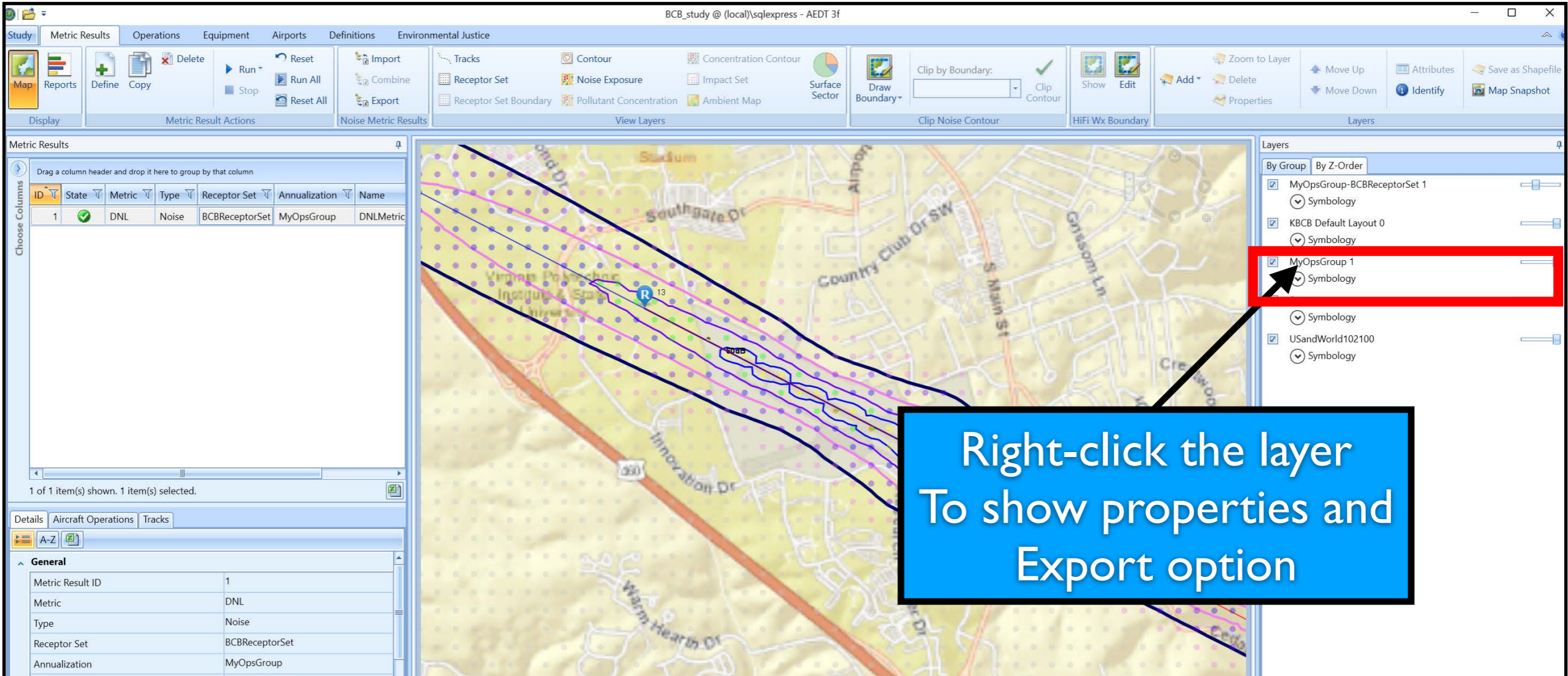
AEDT Reports: Noise Exposure Map

- Detailed report of noise metric at each receptor
- 40,000 receptors in our simple BCB analysis
- DNL reported at each receptor



Export Layers to Other Applications

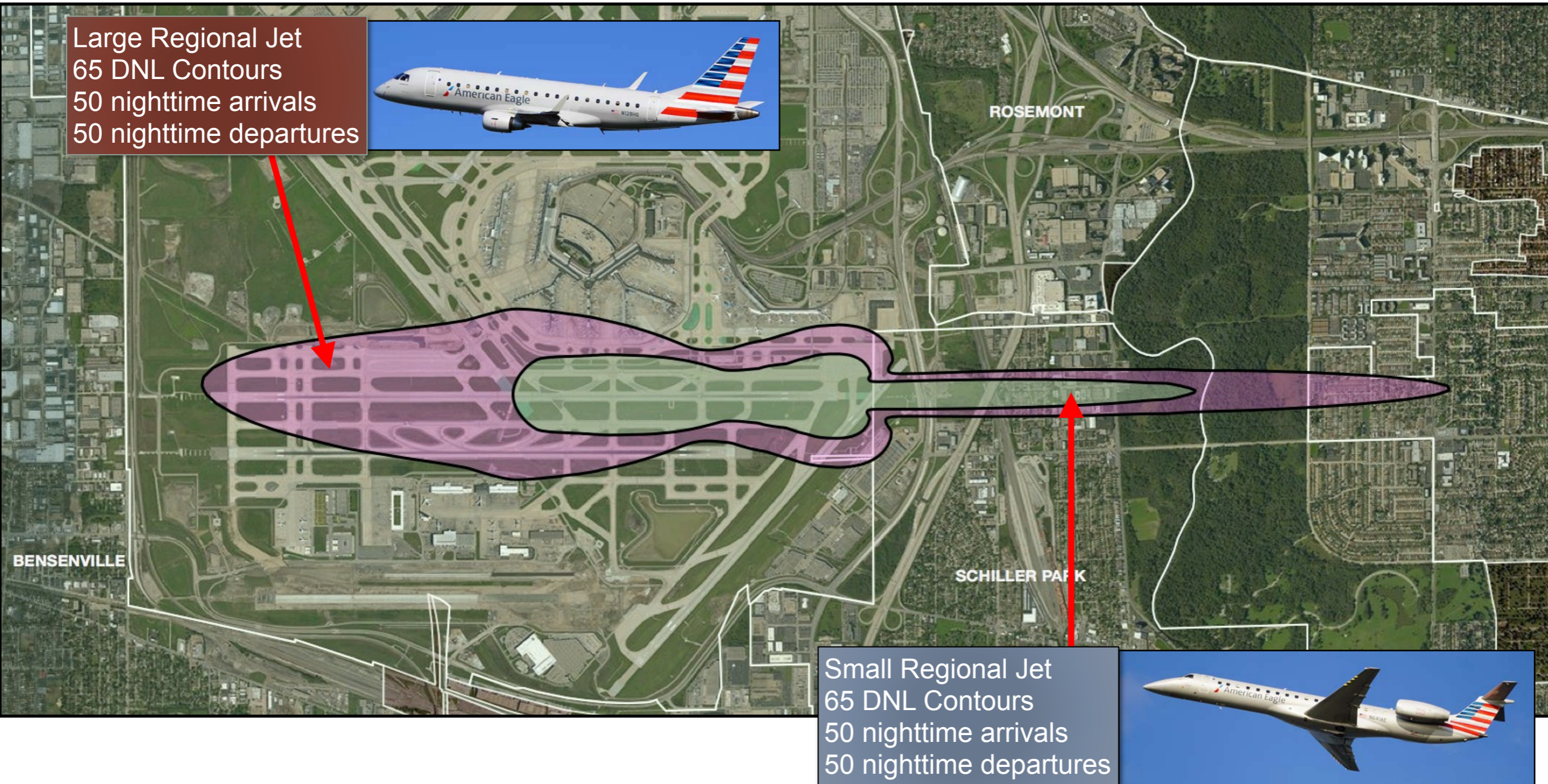
- Layers generated by AEDT can be exported in shape file format to other applications
- Select the layer and right-click to show the properties and export options



The screenshot shows the AEDT software interface. The main window displays a map with various noise contours and receptor sets. On the left, the 'Metric Results' table is visible, showing a single result with ID 1, State checked, Metric DNL, Type Noise, Receptor Set BCBReceptorSet, and Annualization MyOpsGroup. The 'Layers' panel on the right lists several layers, with 'MyOpsGroup 1' highlighted in a red box. A blue callout box with white text and a black border points to this layer, containing the instruction: 'Right-click the layer To show properties and Export option'.

ID	State	Metric	Type	Receptor Set	Annualization	Name
1	<input checked="" type="checkbox"/>	DNL	Noise	BCBReceptorSet	MyOpsGroup	DNLMetric

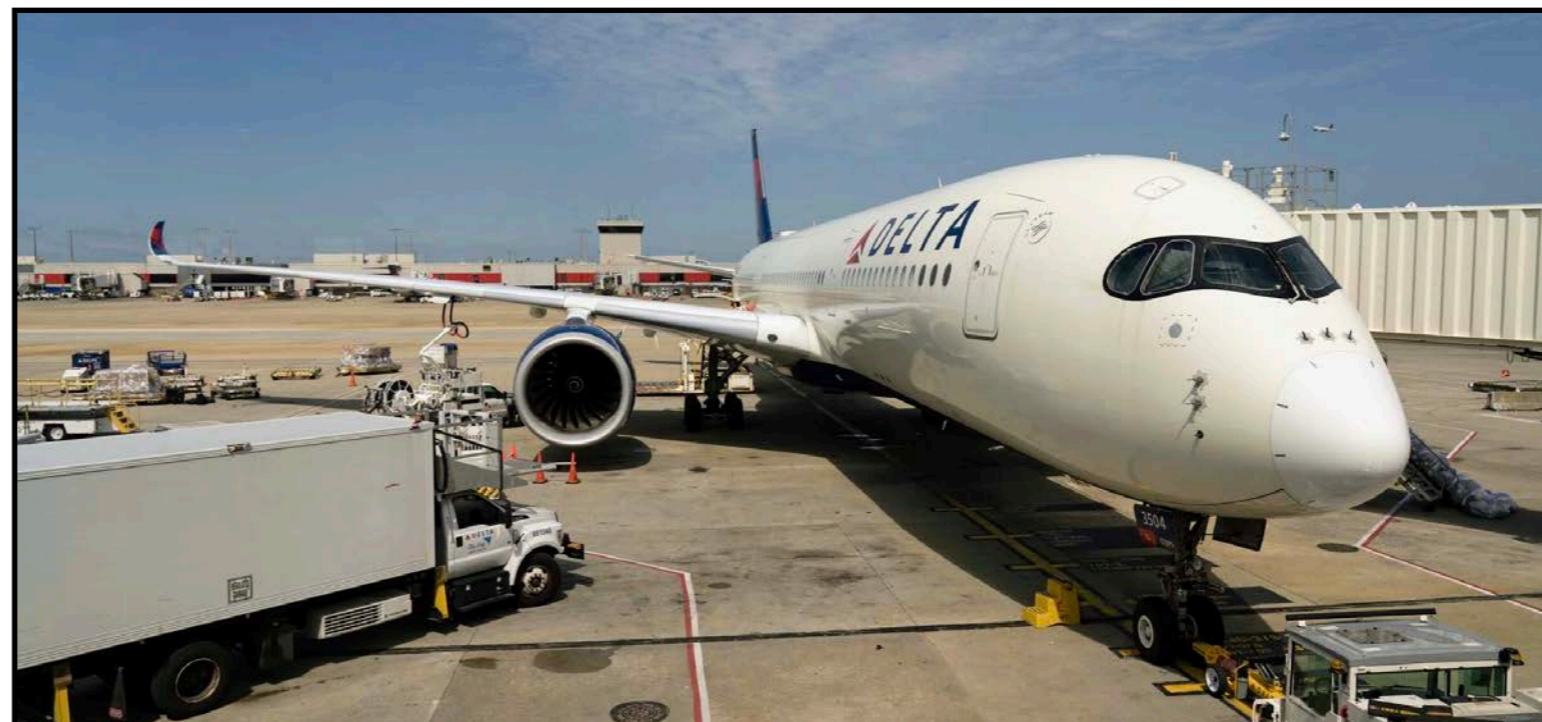
Using GIS Software to Manipulate AEDT Layers



Exported shapefiles in Cartographica

Next Steps

- Add details to the airport
 - Taxiways
 - Ground service equipment
 - Other noise sources



- Predict population affected by each contour level
- Predict noise levels at discrete points in the community
 - Churches
 - Schools
 - Hospitals