

# SUMO: Satellite Image and Vehicle Shapes

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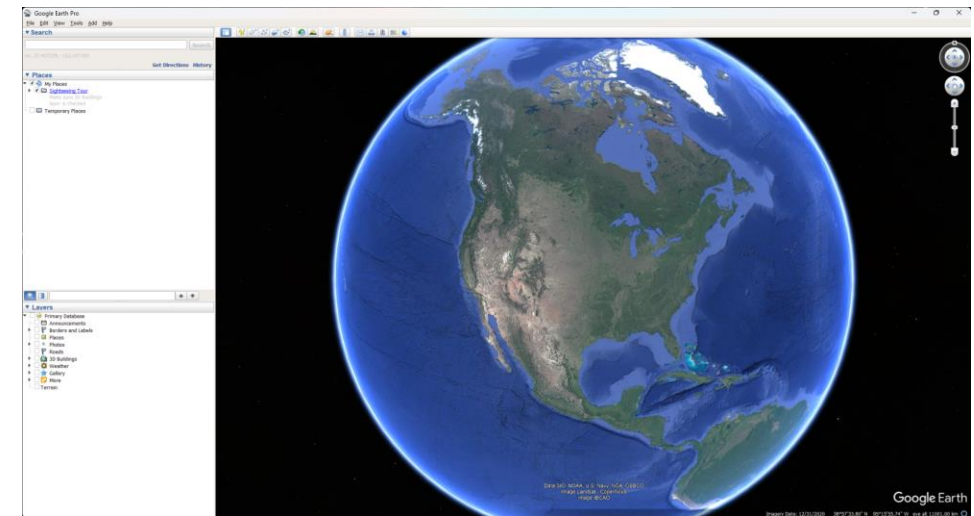
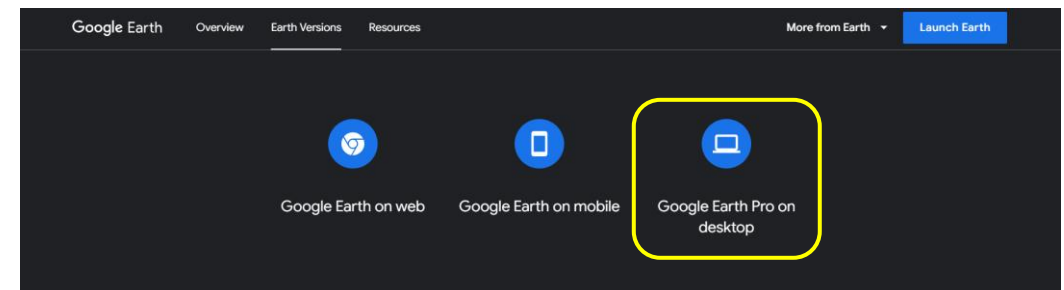
# Files for Today's Session

- Download and extract the zip file:



<https://tinyurl.com/cs690-lab2>

- Download and install **Google Earth Pro**
  - <https://www.google.com/earth/about/versions/>



# Agenda

- Why use satellite images?
- Getting satellite images
- Adding images to SUMO
- Adjusting and aligning images
- Saving decals
- Custom vehicle shapes

# Download Satellite Image

- Download and launch [Google Earth Pro](#) on your computer.
- Use the search bar to find the location you are interested in.
- Using the sunlight icon and adjusting the time slider, you can obtain a daytime or nighttime image as desired.
- Save the image in a common format like JPG or PNG by going to `File > Save > Save Image`.

# Adjust Image Resolution to Match the Network's Scale

- Launch [Netedit](#) and select `File > New Network`.
- Select `Edit > Edit Visualization`. Load the image you obtained from Google Earth Pro (or another source) and enter the width and height based on its resolution. Then click OK.

# Adjust Image Resolution to Match the Network's Scale

View Settings

standard ☐ Export includes: ☐ Viewport ☐ Delay ☐ Decals ☐ Breakpoints

Background

Streets

Vehicles

Persons

Containers

Junctions

Additional

Demand

POIs

Polygons

Selection

Data

Legend

Decals:

	filename	centerX	centerY	width	height	rotation	layer	sRel
0	C:\Users\HP\Desktop\mem_day.png	0.00	0.00	3840.00	2160.00	0.00	0.00	<input type="checkbox"/> false

☐ Toggle grid

x-spacing  y-spacing

Color

# Adjust Image Resolution to Match the Network's Scale

- Create an edge with its two ends aligning with the scale bar shown in the image. Use the search tool to find the length (L) of the scale bar in Netedit.



# Adjust Image Resolution to Match the Network's Scale

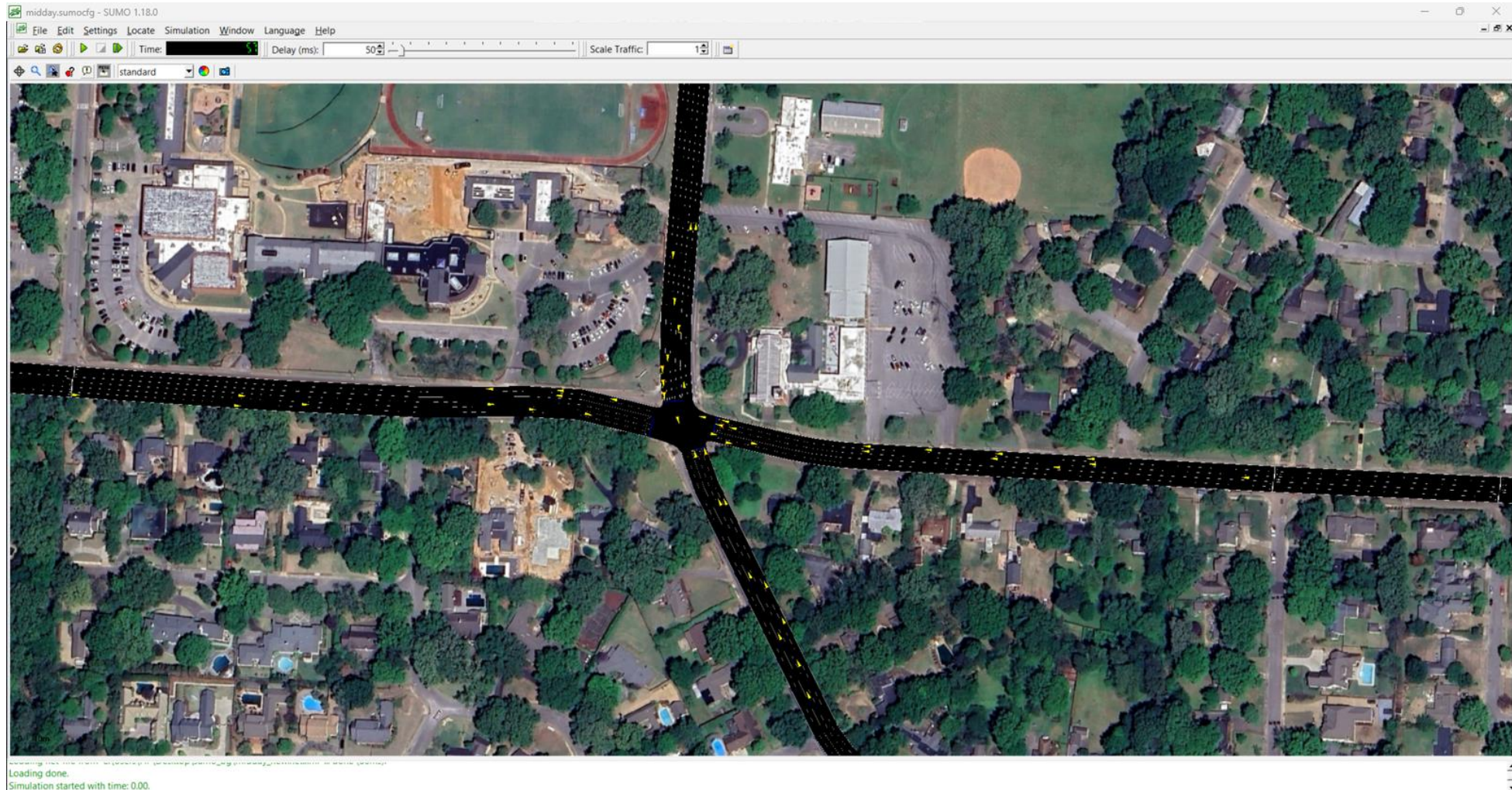
- The adjusted height ( $H'$ ) and width ( $W'$ ) of the image to match it with the network size can be calculated from the original height ( $H$ ) and width ( $W$ ) as follows:
  - $H' = H * S / L$
  - $W' = W * S / L$
- Here,  $S$  is the represented length on the scale bar in the image.
- For example, in the sample pictures above,  $H = 2160$ ,  $W = 3840$ ,  $S = 100$ , and  $L = 259.16$ .
- You can save these settings by clicking the 'Save XML decals' button.



# Load The Image in sumo-gui and Set the Image Resolution

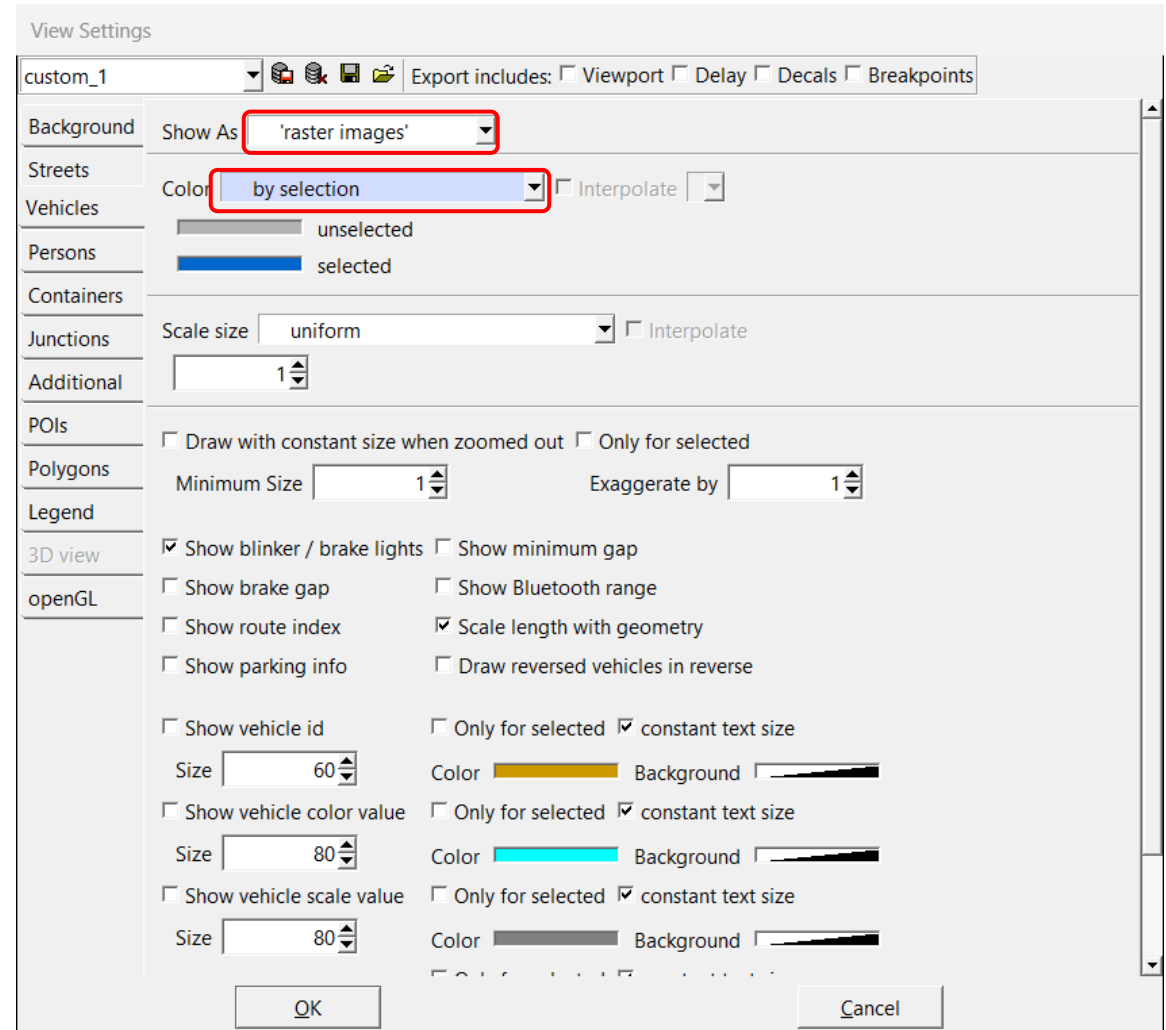
- Open the corresponding .sumocfg file in [sumo-gui](#).
- Select `Edit > Edit Visualization`. Load the image you prepared.
- Set the image's width as  $W$  and height as  $H$  according to the calculations from the previous step.
- In the same window, adjust the values in the centerX, centerY, and rotation fields to properly position the image behind the network. Or load the saved decals xml file ('Load XML decals' button).

# Load The Image in sumo-gui and Set the Image Resolution



# Custom Vehicle Shape

- We can also modify vehicle color or use custom vehicle image.
- Edit the route file (\*.rou.xml) referenced in the \*.sumocfg file. You can modify their color attribute (e.g., change to "red" or "yellow") or set a custom image file using the imgFile attribute (e.g., "custom\_car.png").
- Make sure to select 'raster images' from the Show As list and 'by selection' from color list on the View Settings window.
- Details of these and other related attributes can be found in the [SUMO Documentation](#).



## Mini Challenge: 10 Minutes

- Open network2 folder.
  - Run the simulation in network2.sumocfg with background2.png as the background image and car2.png (located in the icons folder) as the custom icon for the cars.
- [ **Hint:** the centerX and centerY values for the background lie within **1800-2000** and **800-1000** respectively. ]