Traffic light

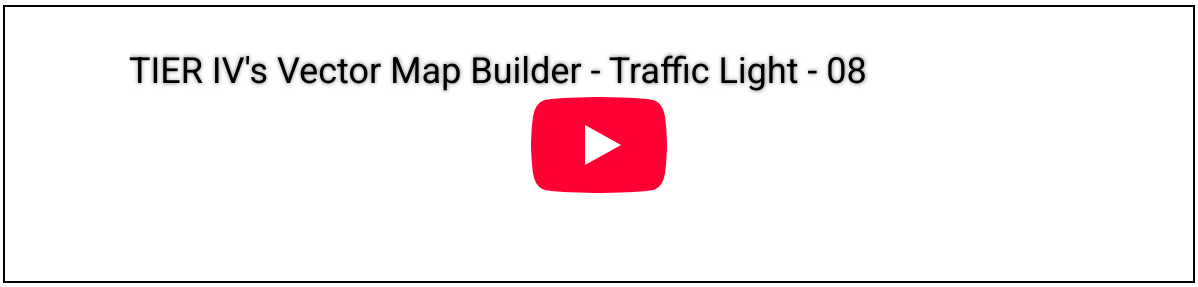
Behavior velocity planner's traffic light module plans velocity according to the traffic light status. In order to operate that, we will add traffic light attribute to our lanelet2 map.

Creating a traffic light regulatory element

In order to create a traffic light on your pointcloud map, please follow these steps:

1. Please select lanelet which traffic light to be added.
2. Click `Abstraction` button on top panel.
3. Select `Traffic Light` from the panel.
4. Click on the desired area for inserting traffic light.

You can see these steps in the traffic-light creating demonstration video:



Testing created the traffic light element with planning simulator

After the completing of creating the map, we need to save it. To that please click `File` --> `Export Lanelet2Maps` then download.

After the download is finished, we need to put lanelet2 map and pointcloud map on the same location. The directory structure should be like this:

```
+ <YOUR-MAP-DIRECTORY>/
+  ├─ pointcloud_map.pcd
+  └─ lanelet2_map.osm
```

If your .osm or .pcd map file's name is different from these names, you need to update autoware.launch.xml:

```
  <!-- Map -->
-  <arg name="lanelet2_map_file" default="lanelet2_map.osm" description="lanelet2
map file name"/>
+  <arg name="lanelet2_map_file" default="<YOUR-LANELET-MAP-NAME>.osm"
description="lanelet2 map file name"/>
-  <arg name="pointcloud_map_file" default="pointcloud_map.pcd"
description="pointcloud map file name"/>
+  <arg name="pointcloud_map_file" default="<YOUR-POINTCLOUD-MAP-NAME>.pcd"
description="pointcloud map file name"/>
```

Now we are ready to launch the planning simulator:

```
ros2 launch autoware_launch planning_simulator.launch.xml map_path:=<YOUR-MAP-
FOLDER-DIR> vehicle_model:=<YOUR-VEHICLE-MODEL> sensor_model:=<YOUR-SENSOR-KIT>
```

Example for tutorial_vehicle:

```
ros2 launch autoware_launch planning_simulator.launch.xml
map_path:=$HOME/Files/autoware_map/tutorial_map/ vehicle_model:=tutorial_vehicle
sensor_model:=tutorial_vehicle_sensor_kit vehicle_id:=tutorial_vehicle
```

1. Click `2D Pose Estimate` button on rviz or press `P` and give a pose for initialization.
2. Click `Panels` -> `Add new panel`, select `TrafficLightPublishPanel`, and then press `OK`.
3. In TrafficLightPublishPanel, set the ID and color of the traffic light.
4. Then, Click `SET` and `PUBLISH` button.
5. Click `2D Goal Pose` button on rviz or press `G` and give a pose for goal point.
6. You can see the traffic light marker on the rviz screen if you set the traffic light color as `RED`.

Traffic Light markers on rviz:

Traffic light test on the created map.

You can check your traffic light elements in the planning simulator as this demonstration video:

TIER IV's Vector Map Builder - Traffic Light Test - 09