

TRAM PRIORITY (PTV EPICS)

Short description

Signal controlled intersection with public transport lines and tram priority using PTV Epics.

Requirements

PTV Vissim Modules: Epics, Vissig

Objective

Signals play a significant role for the traffic flow quality in urban networks. This example shows how PTV Epics is used to enable public transport preemption. The example consists of the following steps:

- Observe simulation without public transport prioritization for a tramline.
- Add public transport prioritization for a tramline.
- Observe simulation with public transport prioritization for a tramline.

Modelling steps

Observe current state - without public transport prioritization

1. Open the INPX file TRAM PRIORITY EPICS.INPX.
2. Start the simulation.
3. Observe the trams entering the network from East and West at simulation second 60.
4. Observe the approaching trams and their waiting times in front of the signal heads.
 - The trams will have to wait quite a while until they get green.
 - The signal groups SG 16 and SG 17 will get green on a regular basis, even if no tram is approaching.
5. Stop the simulation.

Add public transport prioritization

6. At the bottom, change to the **Detectors** list.
7. Look at the detectors named "K3-Tram-On" and "K3-Tram-Off"
We are going to use these detectors for prioritization of the tram approaching from the West:
 - "K3-Tram-On" is the log-in-detector far away from the stop line and will be used to tell PTV Epics that a tram is approaching. The long distance allows PTV Epics to prepare properly.
 - "K3-Tram-Off" is the log-off-detector directly after the stop line and will be used to tell PTV Epics that the tram has successfully passed the signal head.
8. At the bottom, change to the **Signal Controllers / Signal Groups** list.
9. Right-click the only entry and select **Edit SC**.
The GUI for Epics/Balance-Local opens.
10. In **Signal groups** deactivate **Cyclical in P1** for the signal groups 16 "T1" and 17 "T3" by double clicking the tick mark.
These are the signal groups for the tramlines and these settings tell PTV Epics that in signal program 1 it is allowed to skip these signal groups within a cycle if no one needs them. This makes the corresponding stage optional/upon request.
The editor will display warnings, ignore these, we will fix them with the next steps.
11. Select **Detector/calling-point pairs**.
Detector/calling-point pairs are a pair of detectors or calling points consisting of at least one log-in and one log-off detector or calling point.
Take note that the pair for the tram approaching from the East exists already.
12. Click on the **plus** symbol and add a new pair.
13. For the new pair in the column **Log-in** choose detector 23.
14. For the new pair in the column **Log-off** choose the detector 24.
15. For the new pair in the column **Veh. time log-off** enter the value 120.
This means that if the Log-off detector is not triggered within 120 seconds after the Log-in detector PTV Epics will log off the vehicle by force - this is relevant for real-world detectors that might fail to detect a vehicle.
16. Expand the tree **Signal groups**.
17. Select the signal group 16: T1, right-click on it and choose **Add public transport demand**.
18. In the column **Travel time** enter the value 20.
This is the typical travel time between log-in and log-off detector for the tram approaching from the East.
19. In the column **calling-point pair** choose the calling-point pair 3.
20. Select the signal group 17: T3, right-click on it and choose **Add public transport demand**.
21. In the column **Travel time** enter the value 50.
This is the typical travel time between log-in and log-off detector for the tram approaching from the West.
On this approach the stop is before the signal, therefore the travel time is longer and less certain.
22. In the column **calling-point pair** choose the calling-point pair 4.
23. Click on **Save**.
24. Exit the GUI.

Observe target state - with public transport prioritization

25. Start the simulation.

26. Observe the trams like before.

- This time the trams will get green in a very timely manner.
- The signal groups SG 16 and SG 17 will only get green if there is a tram approaching.

27. Stop the simulation.



Note: The example folder contains several sig-files:

- TRAM PRIORITY EPICS.SIG

The working version that you will change when working through the example.

- TRAM PRIORITY EPICS - WITHOUT PT PRIO.SIG

The starting version - if you want to redo the example, copy this file and overwrite TRAM PRIORITY EPICS.SIG with it.

- TRAM PRIORITY EPICS - WITH PT PRIO.SIG

The target version, this is how TRAM PRIORITY EPICS.SIG should look like after the example. Use this if you struggle with following the steps.