

## Assignment 2.3 – spatial databases: pgRouting for emergency response

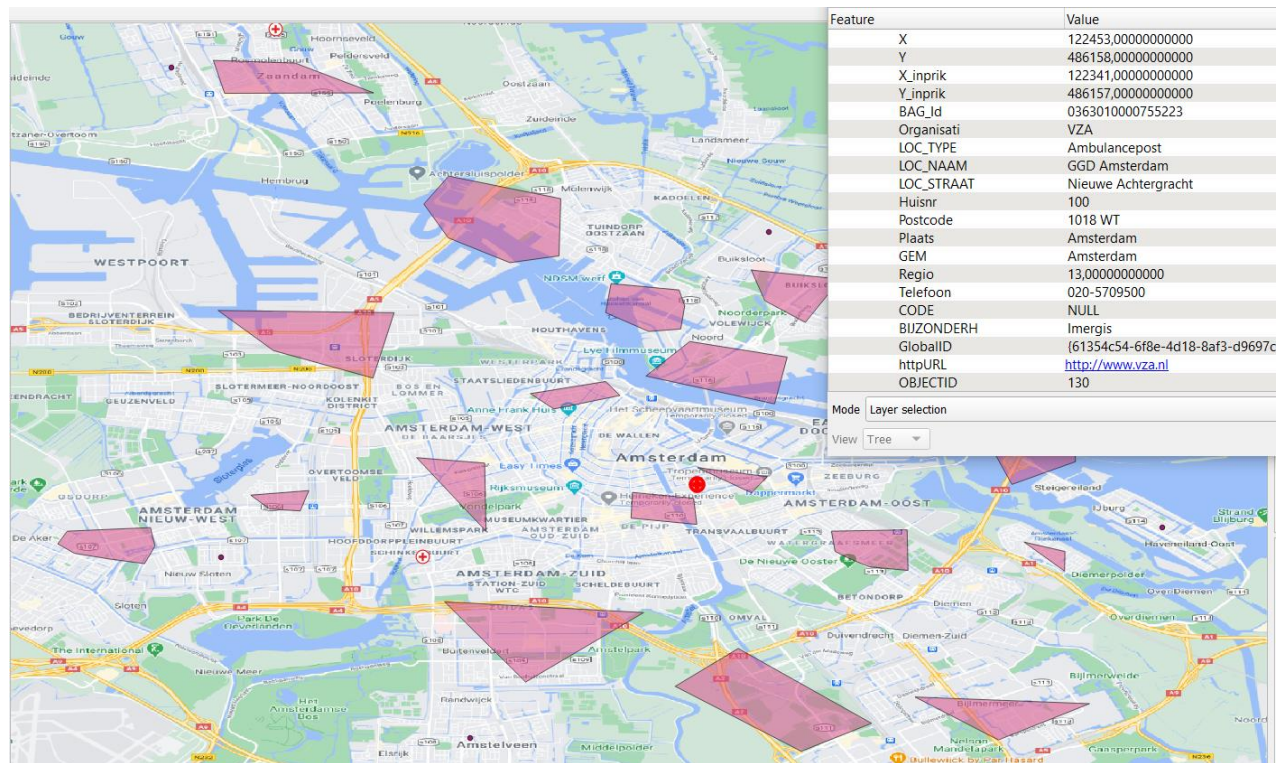
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In this assignment is about navigating an ambulance from its station (130) in Amsterdam located at Nieuwe Achtergracht to 5 different locations within the city. The fastest routes for each location have to take obstacles into consideration which can be seen in the map below as light pink multipolygons in the screenshot below. In order to take these obstacles into proper consideration there is a high “price” added for the use of the streets within the obstacles.

### Task 1



In order to get the nearest node needed to calculate individual routes following SQL query was run within QGIS:

```
SELECT roads_ams_2008_vertices_pgr.id FROM roads_ams_2008_vertices_pgr, ambulance_stations
where ambulance_stations.OBJECTID=130 ORDER BY
ST_Distance(ST_Transform(ST_SetSRID(ambulance_stations.geom, 4326), 28992),
ST_Transform(roads_ams_2008_vertices_pgr.the_geom, 28992)) ASC LIMIT 1;
```

The output gave a result of 19166 being the nearest node from ambulance station 130 in Amsterdam.

In the next step we used the ID from each nearest node to the used destination and ran them individually within the following code substituting for the value 12215 representing one of the five destinations. The destinations used could be identified with the values 1300 , 5715 , 35768, 12215 and 32485.

```
SELECT s.seq, s.node, s.edge, s.cost,  
b.gid, b.geom  
FROM  
(SELECT * FROM pgr_dijkstra ('  
SELECT gid AS id,  
source,  
target,  
cost,  
reverse_cost  
FROM roads_ams_2008', 19166, 12215, false)) s  
LEFT JOIN roads_ams_2008 b ON (b.gid = s.edge)
```

The resulting routes from the ambulance station to the different destinations can be seen in the visualization below.

## Task 2



The following code was used for each destination to query the total cost for each route from the ambulance station to the destination. As previously the values for each destination were used to find the values for each case as seen in the table below.

```
SELECT * FROM pgr_dijkstra('
SELECT gid AS id,
source,
target,
cost,
reverse_cost
FROM roads_ams_2008',
19166, 35768, false);
```

The Origin being the ambulance station with the ID 130 and the previously queried nearest node 19166 is the same for all routes.

### Task 3

Origin/Ambulance Station	Destination	Aggregated Cost
19166	1300	14034.18
	5715	7721.76
	12215	8610.43
	32485	11591.00
	35768	7849.64

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