

Geografski informacioni sistemi

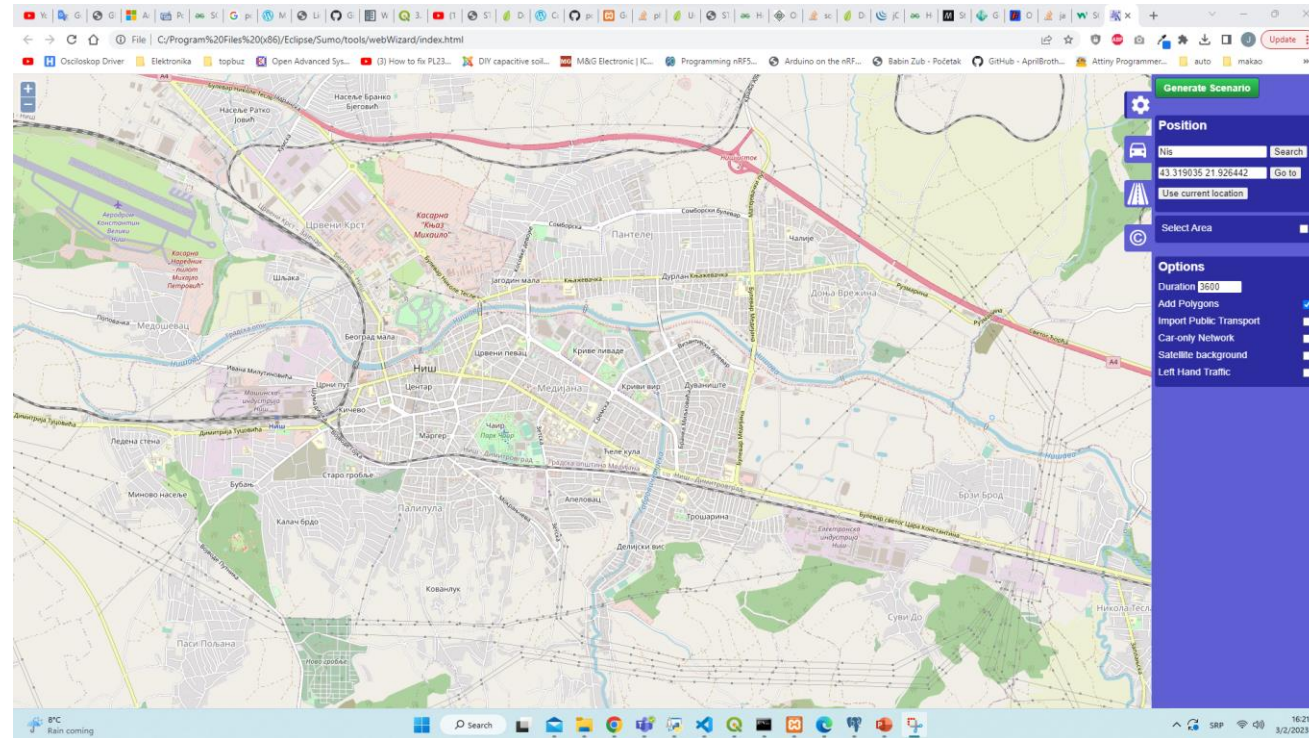
Projekat 3: GIS aplikacija za upravljanje mobilnim objektima u saobraćaju

Student: Jovan Krstic, 1511

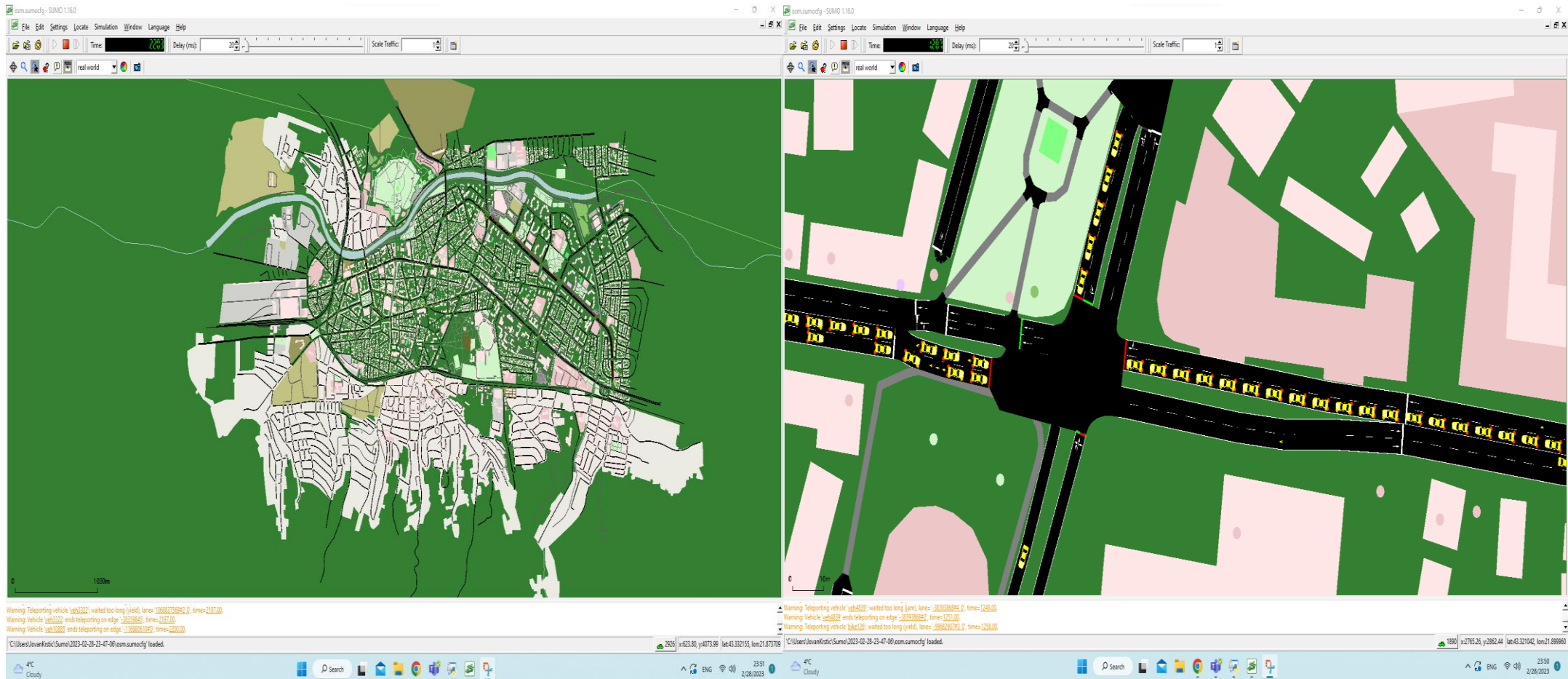
Niš 2023

Za potrebe ovog projekta bilo je potrebno instalirati i konfigurisati SUMO simulator

Nakon instalacije vrsimo konfiguraciju simulatora za područje od interesa pomocu OSM Web Wizar-da gde biramo tip mobilnih objekata i njihovu zastupljenost.



Nakon kreirane simulacije izrađujemo aplikaciju koja preko SUMO API-a očitava vrednosti i vrši njihovo smeštanje u bazi



Simulacija i smeštanje podataka u bazi

- Izradili smo aplikaciju u pythonu koja simulirane podatke smesta u bazu.
- Aplikacija se može naći u folderu `./projekat3/2023-02-28-23-55-12/sumodata.py`

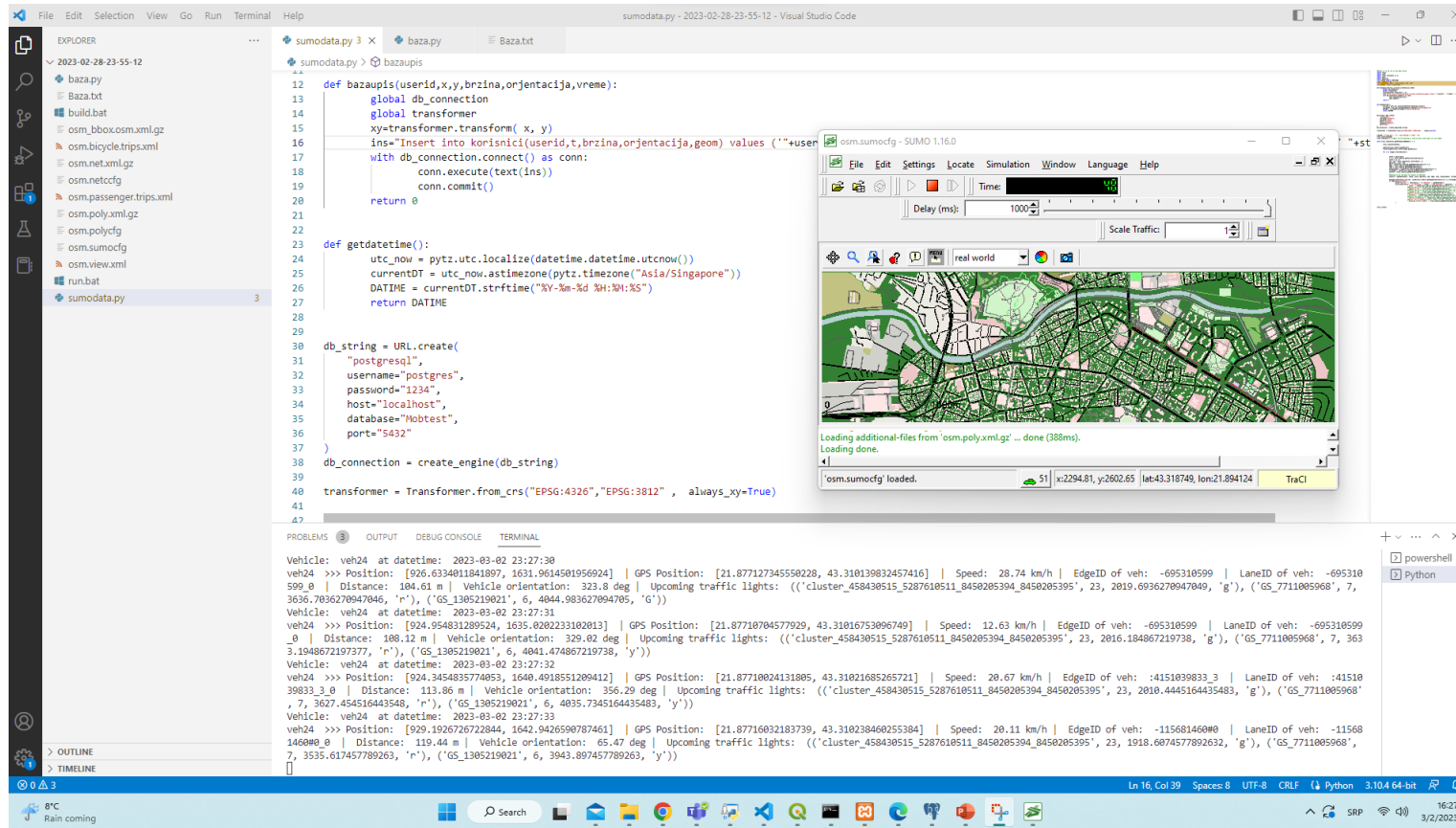
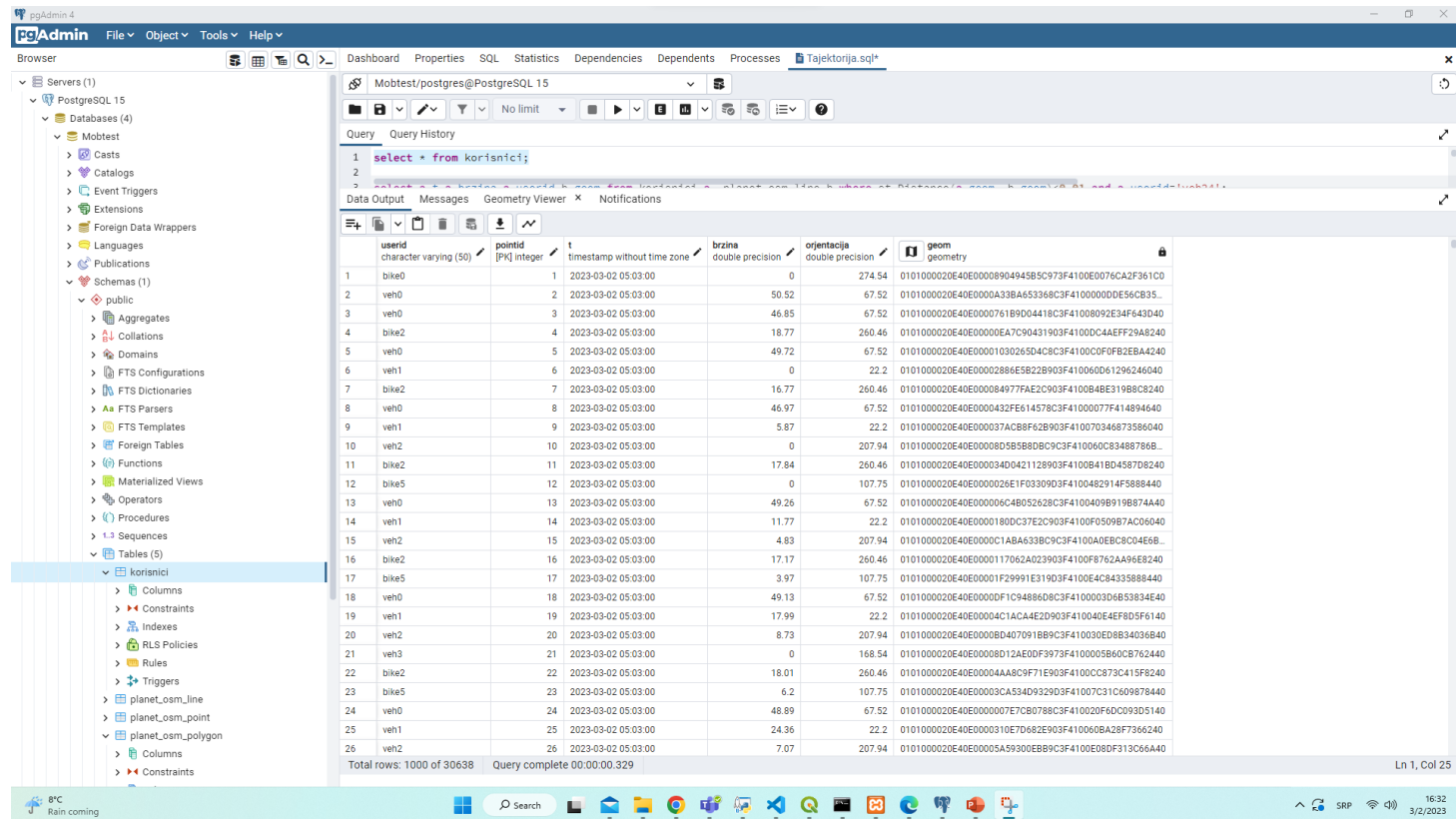


Tabela u bazi sa vozilima iz simulacije i vremenima

- CREATE TABLE Korisnici (UserID VARCHAR (50), pointID SERIAL PRIMARY KEY, t timestamp, brzina float, orijentacija float, geom geometry(Point, 3812));



The screenshot displays the pgAdmin 4 interface. On the left, the 'Browsers' pane shows the database structure: PostgreSQL 15, Databases (4), Mobtest, and Schemas (1). The 'korisnici' table is selected under the 'public' schema. The main window shows the 'Query' tab with a SQL query: `select * from korisnici;`. The 'Data Output' tab displays the results of the query, showing 26 rows of data. The table has the following columns: `userid` (character varying (50)), `pointid` (integer), `t` (timestamp without time zone), `brzina` (double precision), `orijentacija` (double precision), and `geom` (geometry).

	userid	pointid	t	brzina	orijentacija	geom
1	bike0	1	2023-03-02 05:03:00		274.54	0101000020E40E00008904945B5C973F4100E0076CA2F361C0
2	veh0	2	2023-03-02 05:03:00	50.52	67.52	0101000020E40E0000A33BA653368C3F41000000DE56CB35...
3	veh0	3	2023-03-02 05:03:00	46.85	67.52	0101000020E40E0000761B9D04418C3F41008092E34F643D40
4	bike2	4	2023-03-02 05:03:00	18.77	260.46	0101000020E40E0000EA7C90431903F4100DC4AEFF29A8240
5	veh0	5	2023-03-02 05:03:00	49.72	67.52	0101000020E40E00001030265D4C8C3F4100C0F0FB2EBA4240
6	veh1	6	2023-03-02 05:03:00		22.2	0101000020E40E0000288AE5B22B903F410060D61296246040
7	bike2	7	2023-03-02 05:03:00	16.77	260.46	0101000020E40E000084977FAE2C903F4100B4BE319B8C8240
8	veh0	8	2023-03-02 05:03:00	46.97	67.52	0101000020E40E0000432FE614578C3F41000077F414894640
9	veh1	9	2023-03-02 05:03:00	5.87	22.2	0101000020E40E000037AC8F62B903F410070346873586040
10	veh2	10	2023-03-02 05:03:00		207.94	0101000020E40E0000805B5B80BC9C3F410060C8348B786B...
11	bike2	11	2023-03-02 05:03:00	17.84	260.46	0101000020E40E000034D042112B903F4100B41BD4587D8240
12	bike5	12	2023-03-02 05:03:00		107.75	0101000020E40E0000026E1F0330903F4100482914F5888440
13	veh0	13	2023-03-02 05:03:00	49.26	67.52	0101000020E40E000006C4B052628C3F4100409B919B874A40
14	veh1	14	2023-03-02 05:03:00	11.77	22.2	0101000020E40E0000180DC37E2C903F4100F0509B7AC06040
15	veh2	15	2023-03-02 05:03:00	4.83	207.94	0101000020E40E0000C1AB4533BC9C3F4100A0EBC8C04E6B...
16	bike2	16	2023-03-02 05:03:00	17.17	260.46	0101000020E40E0000117062A023903F4100F8762AA96E8240
17	bike5	17	2023-03-02 05:03:00	3.97	107.75	0101000020E40E00001F29991E31903F4100E4C8435888440
18	veh0	18	2023-03-02 05:03:00	49.13	67.52	0101000020E40E0000DF1C94886D8C3F4100003D6B53834E40
19	veh1	19	2023-03-02 05:03:00	17.99	22.2	0101000020E40E00004C1ACA4E2D903F410040E4EF8D5F6140
20	veh2	20	2023-03-02 05:03:00	8.73	207.94	0101000020E40E0000BD407091B9C3F410030ED8B34036B40
21	veh3	21	2023-03-02 05:03:00		168.54	0101000020E40E00008D12AE00F3973F4100005B60CB762440
22	bike2	22	2023-03-02 05:03:00	18.01	260.46	0101000020E40E00004AAB0C9F71E903F4100C0C873C415F8240
23	bike5	23	2023-03-02 05:03:00	6.2	107.75	0101000020E40E00003CA534D932903F41007C31C609878440
24	veh0	24	2023-03-02 05:03:00	48.89	67.52	0101000020E40E000007E7C80788C3F410020F6DC093D5140
25	veh1	25	2023-03-02 05:03:00	24.36	22.2	0101000020E40E0000310E7D682E903F410060BA28F7366240
26	veh2	26	2023-03-02 05:03:00	7.07	207.94	0101000020E40E00005A59300EBB9C3F4100E08DF313C656A40

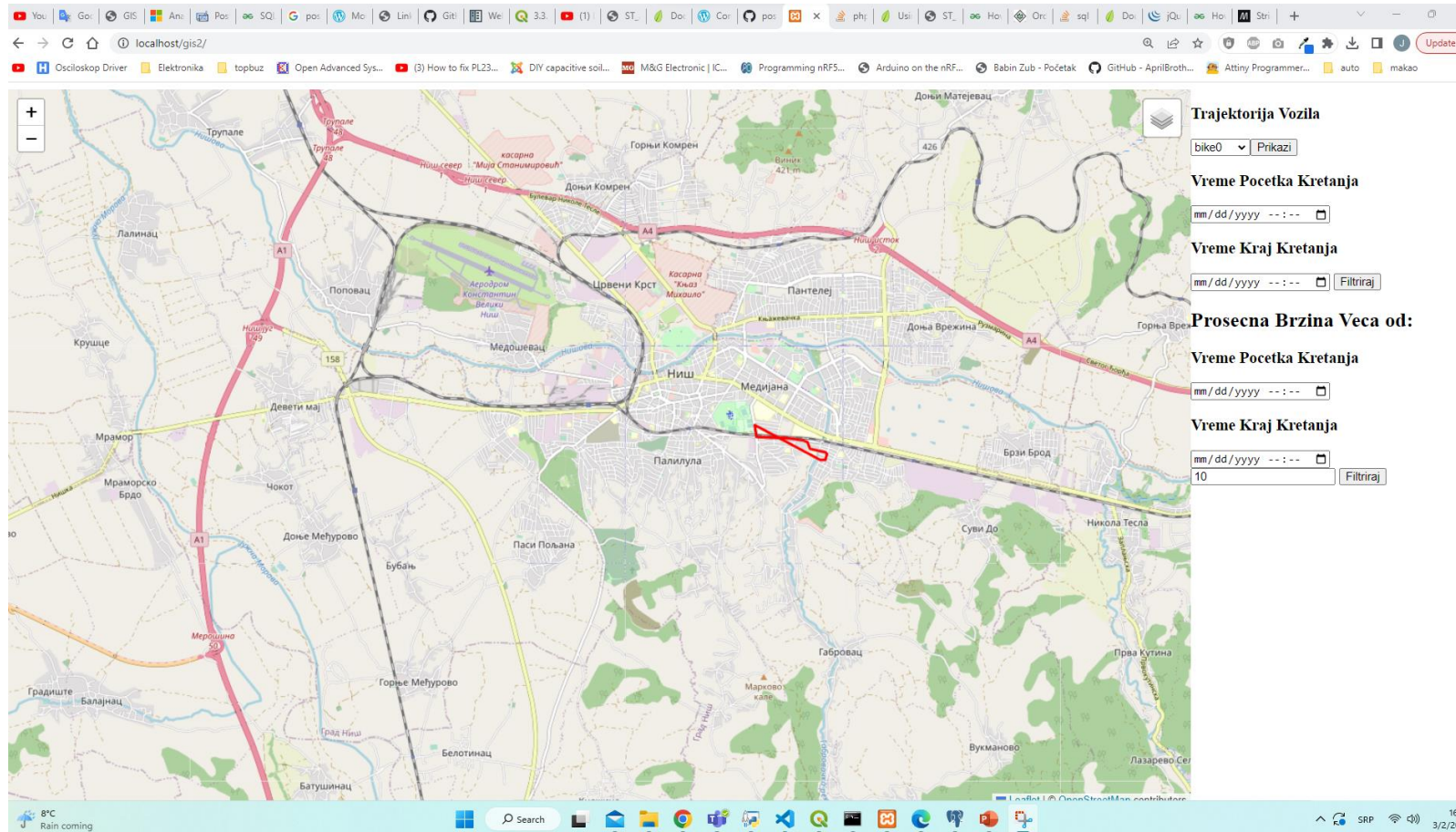
Total rows: 1000 of 30638 Query complete 00:00:00.329 Ln 1, Col 25

Pokrenuli smo i GeoServer koji smo koristili u proslom projekata samo sa novim slojevima za Niš.

The screenshot shows the GeoServer web interface. The top navigation bar includes links for About & Status, Data, Layer Preview, and Demos. The main content area is titled "Layer Preview" and displays a list of 36 layers. The layers are organized into a table with the following columns: Type, Title, Name, Common Formats, and All Formats. The layers listed are:

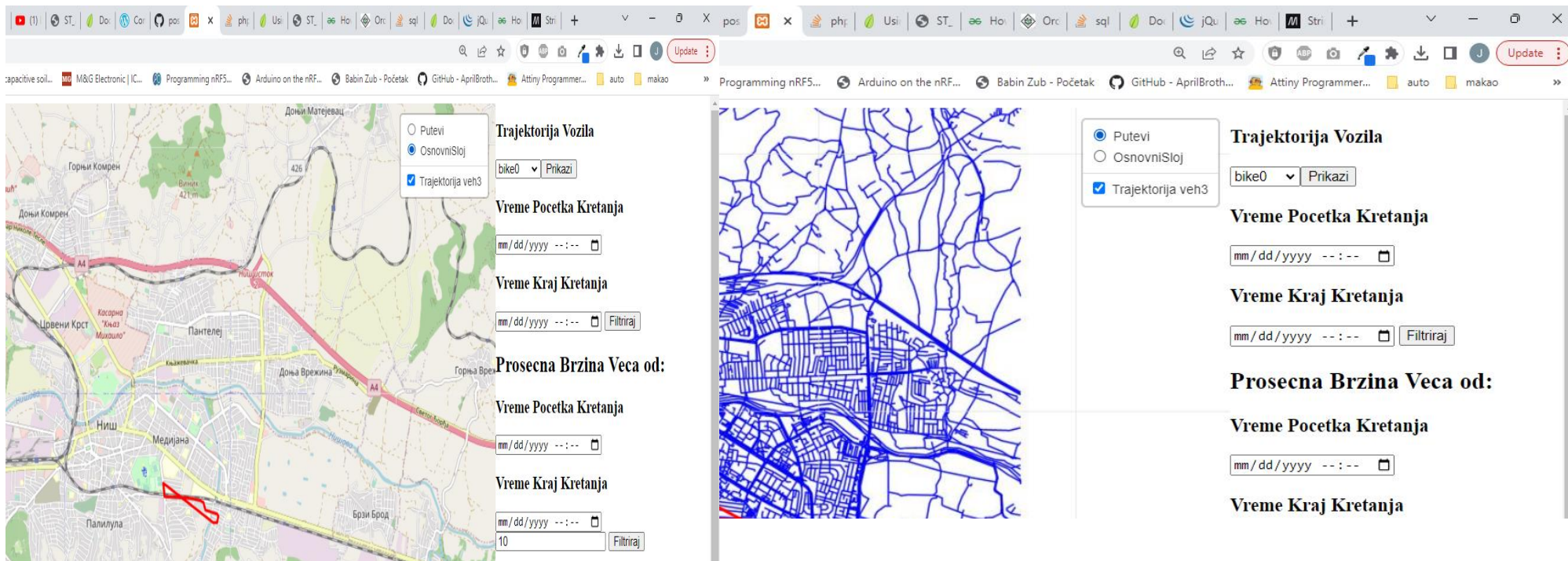
Type	Title	Name	Common Formats	All Formats
planet_osm_line	planet_osm_line	Mobtest:planet_osm_line	OpenLayers GML KML	Select one
planet_osm_point	planet_osm_point	Mobtest:planet_osm_point	OpenLayers GML KML	Select one
planet_osm_polygon	planet_osm_polygon	Mobtest:planet_osm_polygon	OpenLayers GML KML	Select one
Boundary Lines	Boundary Lines	ne:boundary_lines	OpenLayers GML KML	Select one
Coastlines	Coastlines	ne:coastlines	OpenLayers GML KML	Select one
Countries	Countries	ne:countries	OpenLayers GML KML	Select one
Populated Places	Populated Places	ne:populated_places	OpenLayers GML KML	Select one
World Map	World Map	ne:world	OpenLayers KML	Select one
A sample ArcGrid file	A sample ArcGrid file	nurc:Arc_Sample	OpenLayers KML	Select one
North America sample imagery	North America sample imagery	nurc:Img_Sample	OpenLayers KML	Select one
Pk50095	Pk50095	nurc:Pk50095	OpenLayers KML	Select one
mosaic	mosaic	nurc:mosaic	OpenLayers KML	Select one
Spearfish archeological sites	Spearfish archeological sites	sf:archsites	OpenLayers GML KML	Select one
Spearfish bug locations	Spearfish bug locations	sf:bugsites	OpenLayers GML KML	Select one
Spearfish restricted areas	Spearfish restricted areas	sf:restricted	OpenLayers GML KML	Select one
Spearfish roads	Spearfish roads	sf:roads	OpenLayers GML KML	Select one
Spearfish elevation	Spearfish elevation	sf:elevation	OpenLayers KML	Select one

Aplikaciju za ovaj projekta kreiramo koristeći PHP i Leaflet biblioteku

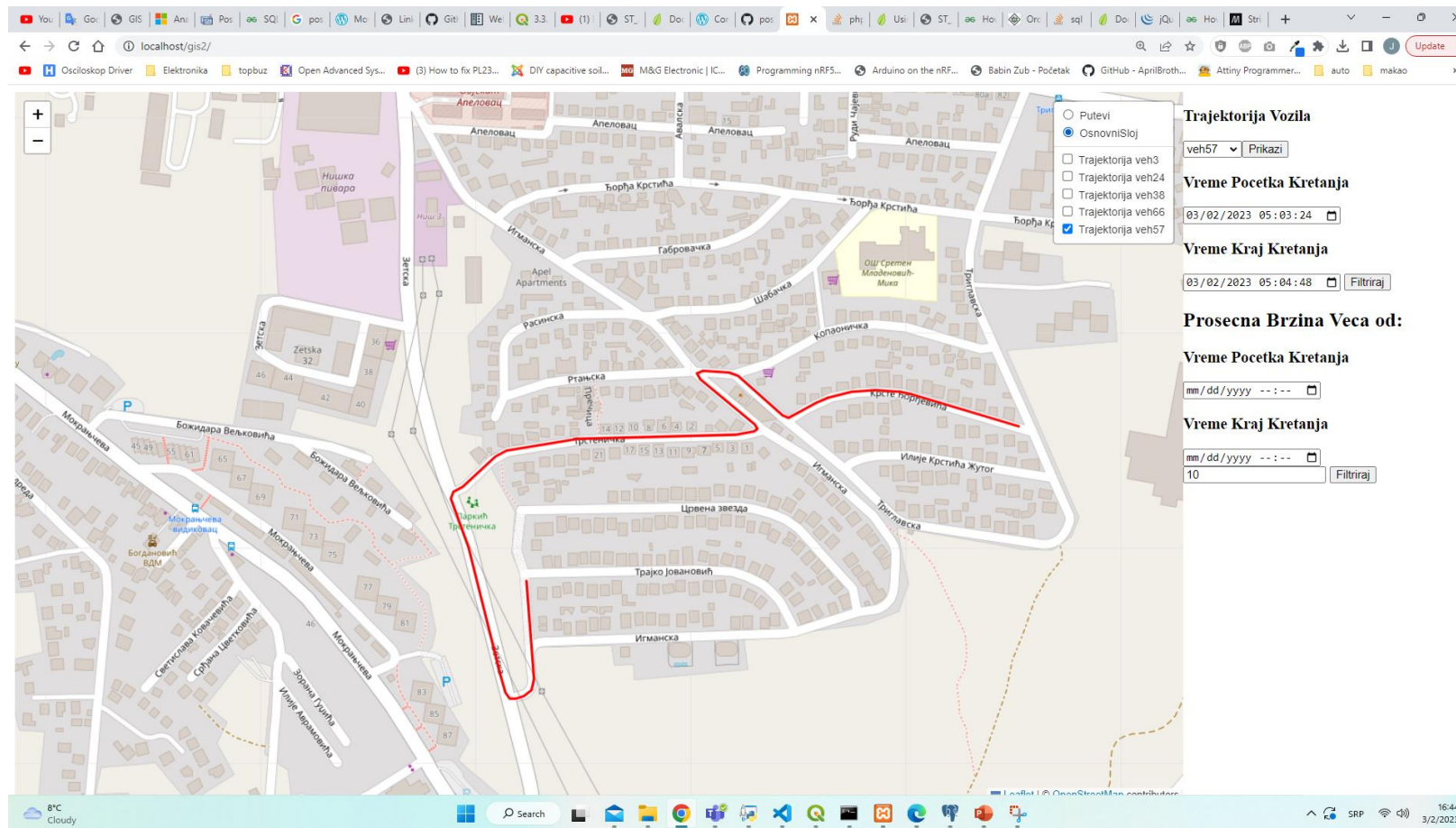


U ovoj aplikaciji imamo dva osnovan sloja sloj puteva i OSM sloj.

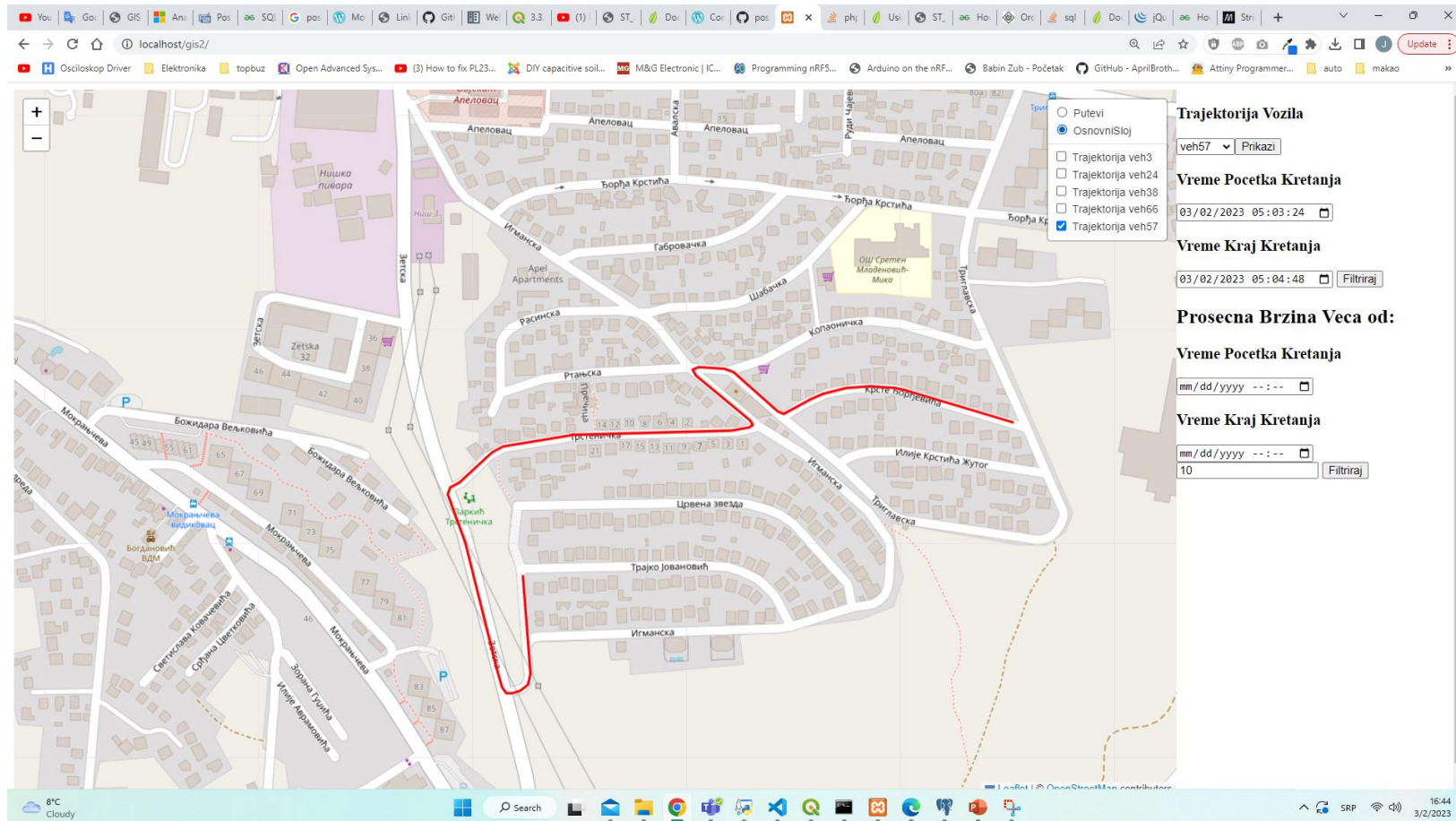
- Sloj Puteva ucitavamo koristeći WMS servis sa GeoServera



Na desnoj strani se nalazi selektor sa padajucim menijem u kome mozemo izabrati vozilo za koje zelimo trajektoriju da iscrtavimo u potpunosti.



Nakon odabira vozila klikom na dugme prikazi iscrtava se trajektorija i vrši njeno dodavanje u slojeve.



Pored pune trajektorije mozemo iscrtati i samo trajektoriju u odredjenom vremenskom prozoru.

- Ova polja se nakon crtanja pune trajektorije popunjavaju sa maksimalnim vremenskim okvirom za koji postoje podaci u bazi.

Trajektorija Vozila

bike0 ▾ Prikazi

Vreme Pocetka Kretanja

mm/dd/yyyy -- : -- 📅

Vreme Kraj Kretanja

mm/dd/yyyy -- : -- 📅 Filtriraj

Trajektorija Vozila

veh57 ▾ Prikazi

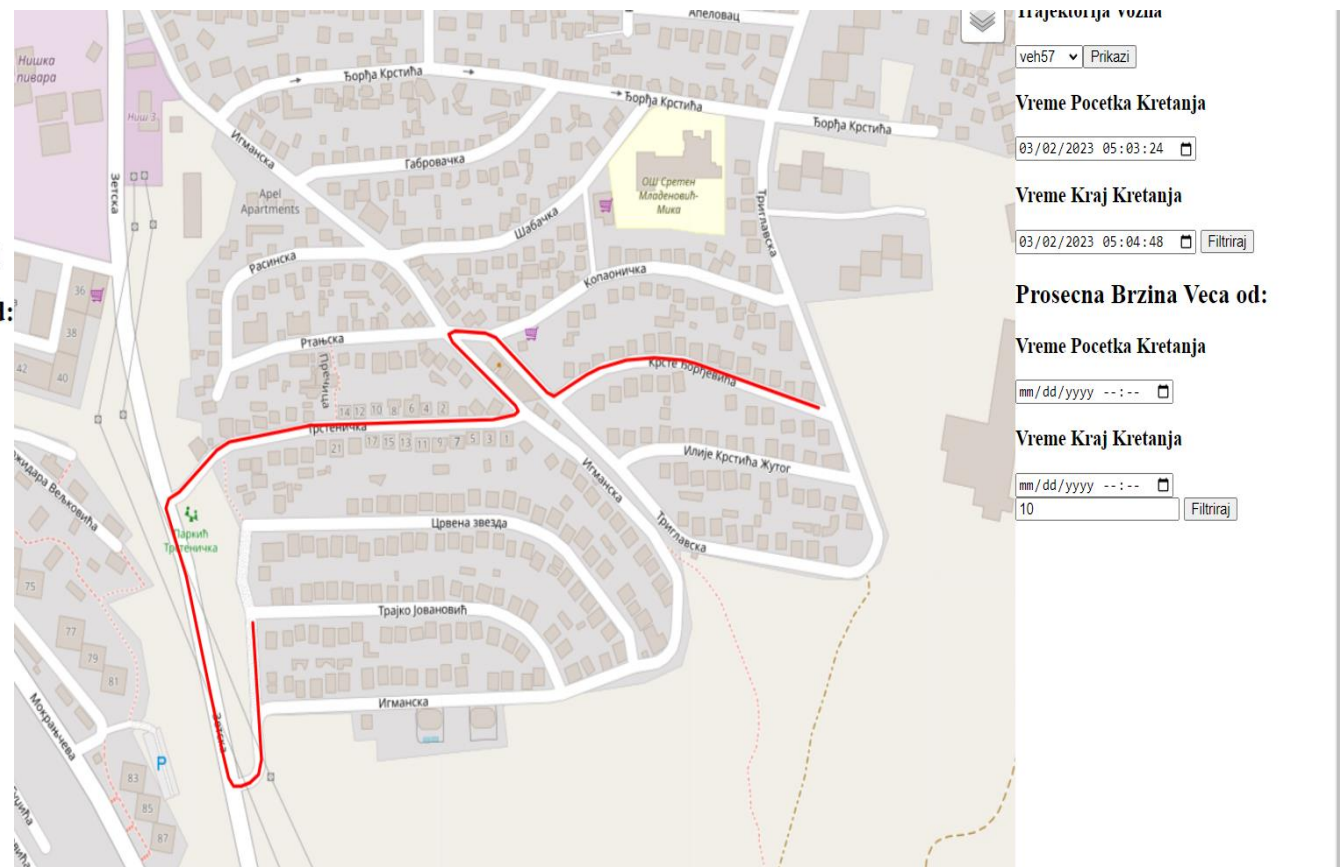
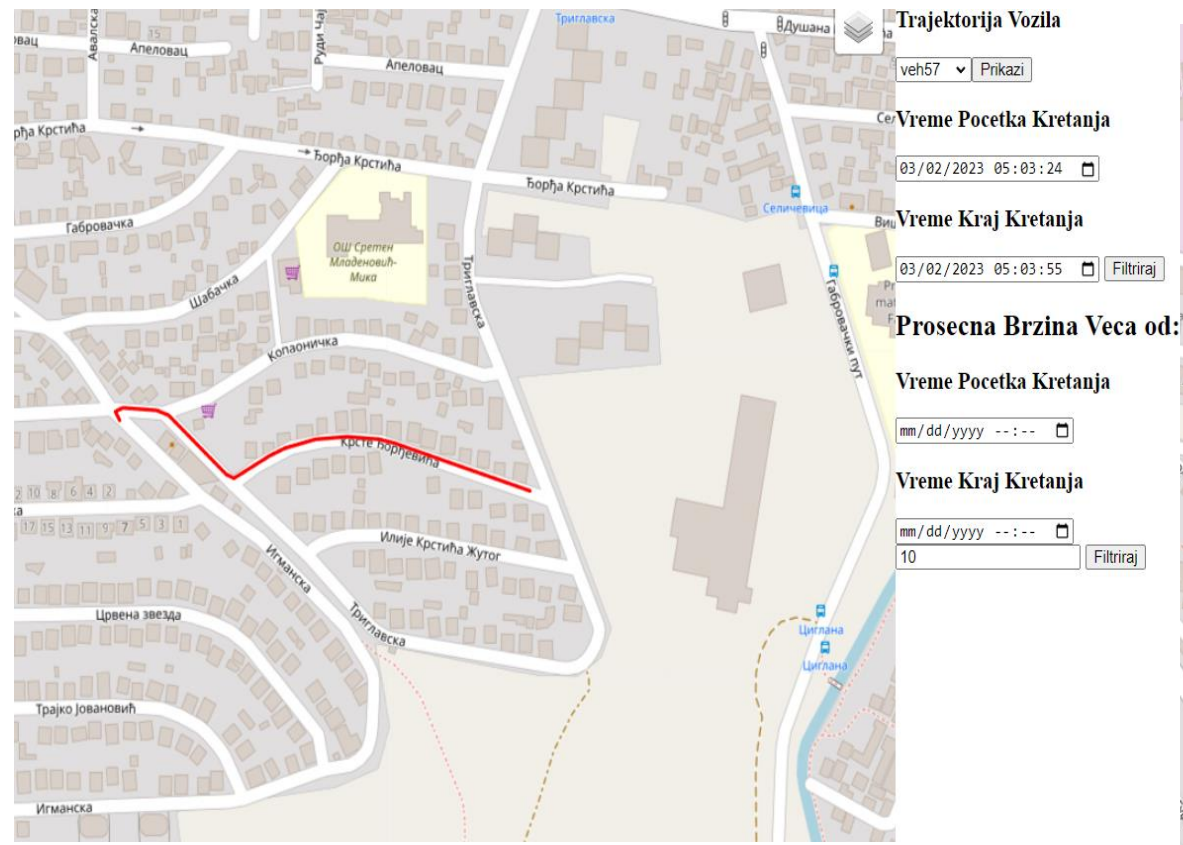
Vreme Pocetka Kretanja

03/02/2023 05:03:24 📅

Vreme Kraj Kretanja

03/02/2023 05:04:48 📅 Filtriraj

Nakon odabira vremenskog intervala i klikom na dugme filtriraj vršimo kreiranje novog sloja sa trajektorijom u vremenskom intervalu.



Pored svega mozemo izvršiti i kreiranje sloja sa svim putevima na kojima se saobraćaju automobili prosečnom brzinom većom od zadate u odredjenom vremenskom okviru



The screenshot shows a web application interface with a map on the left and a form on the right. The form is titled "Prosečna Brzina Veka od:" and contains two date and time selection fields. The first field is labeled "Vreme Pocetka Kretanja" and has a value of "03/02/2023 05:00". The second field is labeled "Vreme Kraj Kretanja" and has a value of "03/02/2023 05:04". Below these fields is a text input field containing the number "35" and a button labeled "Filtriraj".

Prosečna Brzina Veka od:

Vreme Pocetka Kretanja

03/02/2023 05:00

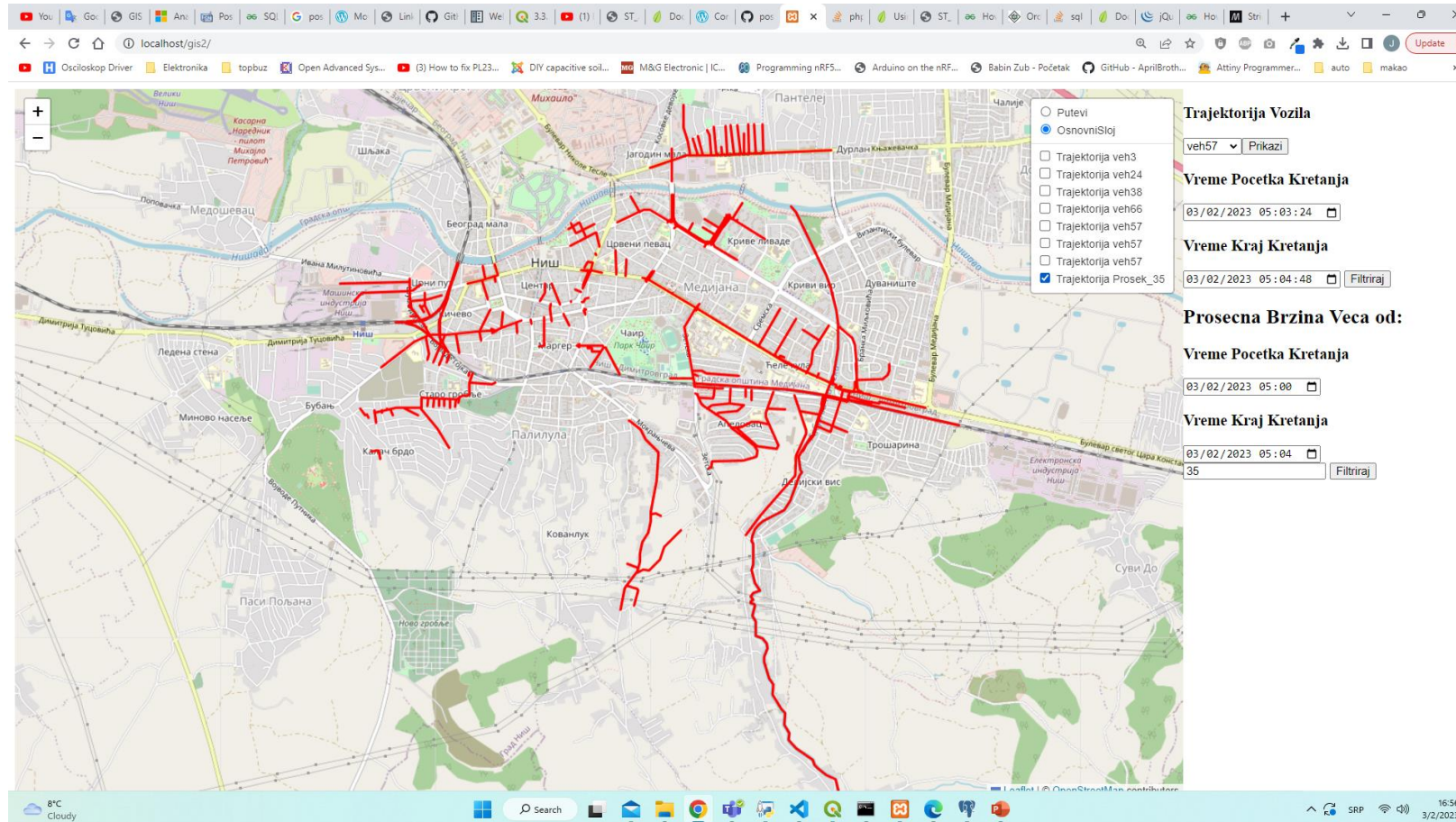
Vreme Kraj Kretanja

03/02/2023 05:04

35

Filtriraj

Primer primene funkcionalnosti sa prethodnog slajda



Organizacija Koda

- Na klijentskoj strani sav kod je smesten u fajlu main.js koji se nalazi u folderu gis2
- Na serverskoj strani smo kreirali sledeće skripte koje se mogu naći u folderu gis2:
 - getSvaVozila.php-Vraca listu vozila koja se nalaze u sistemu
 - getPointEndVozilo.php-Vraca poslednju tacku u vremenu koja se nalazi u bazi za odredjeno vozilo
 - getData.php-Vraca GeoJSON potpune trajektorije vozila
 - getPocetakiKrajKretanaj.php-Vraca GeoJSON trajektorije vozila u zadatom vremenskom intervalu.
 - getVozilouvremenu.php-Vraca GeoJSON ulica na kojima se u zadatom vremenskom intervalu krću vozila prosečnom brzinom većom od zadate.