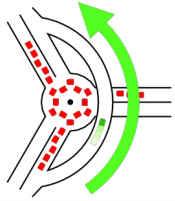


Overpass API

**Freies Undo in
OpenStreetMap
(Zwischenstand)**



Änderungen in OSM

Änderungsanzeige: funktioniert mit **Achavi**

aber:

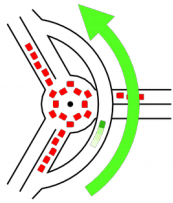
1. Relations

2. Echte Änderungen

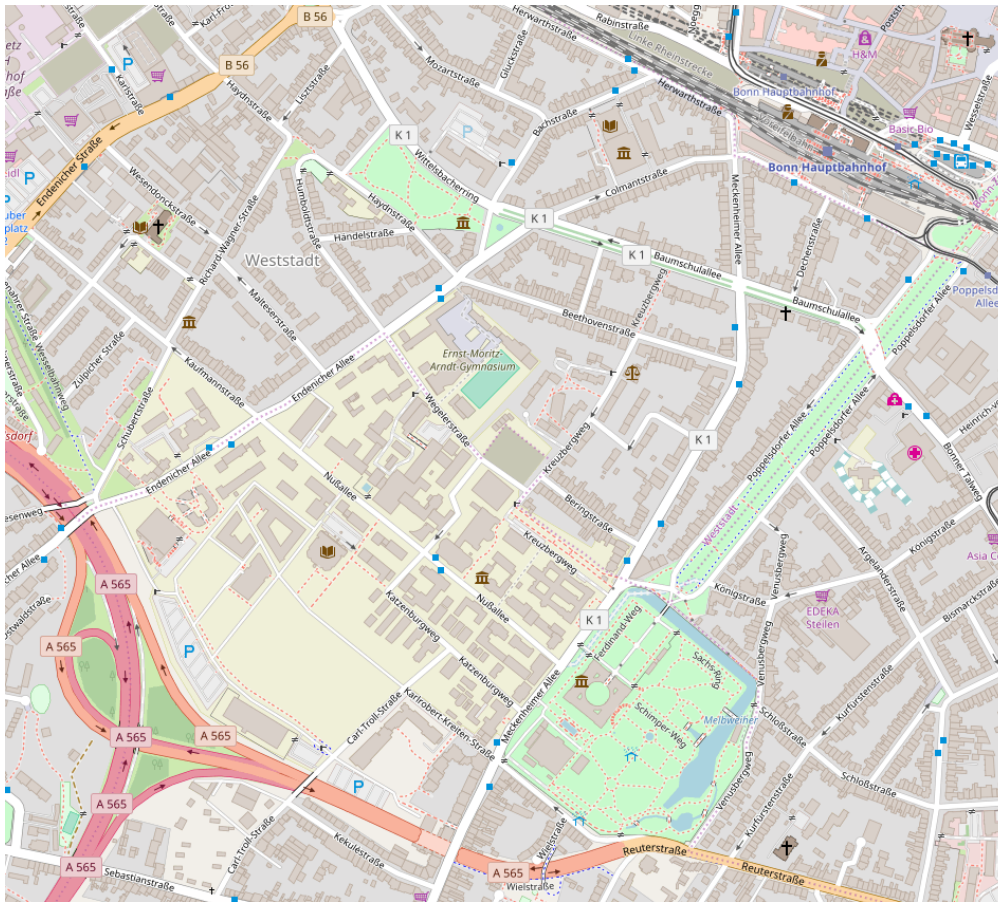
3. Git-Blame

4. Datenmengen

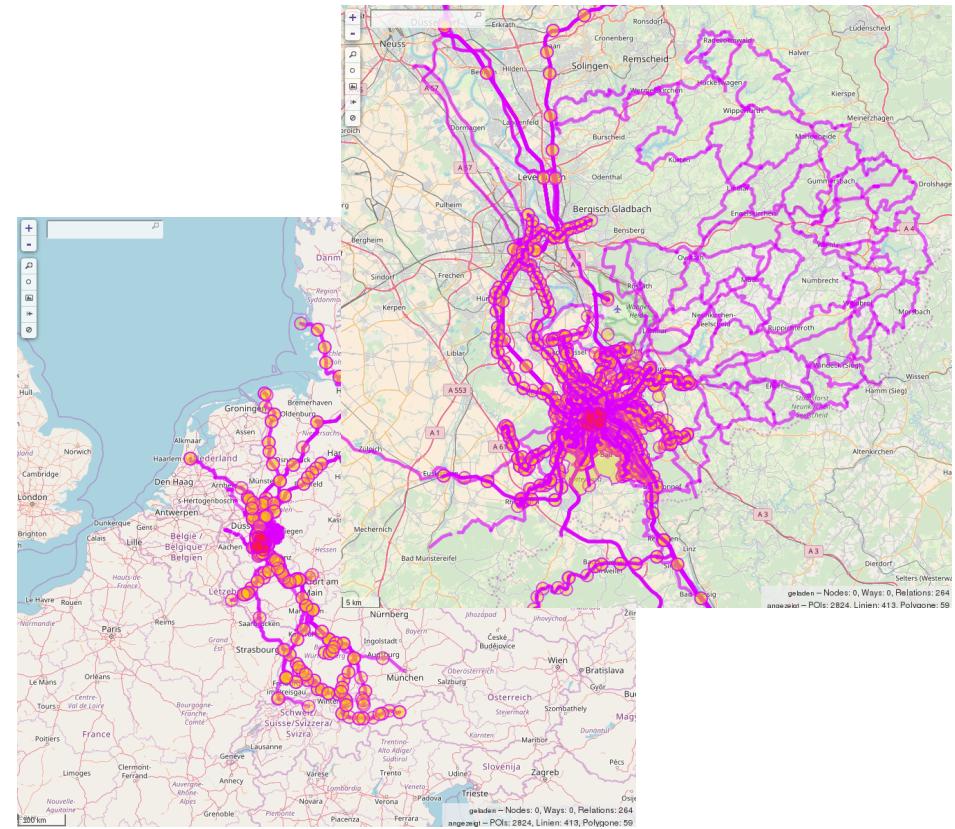


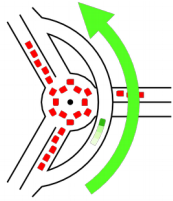


Relations

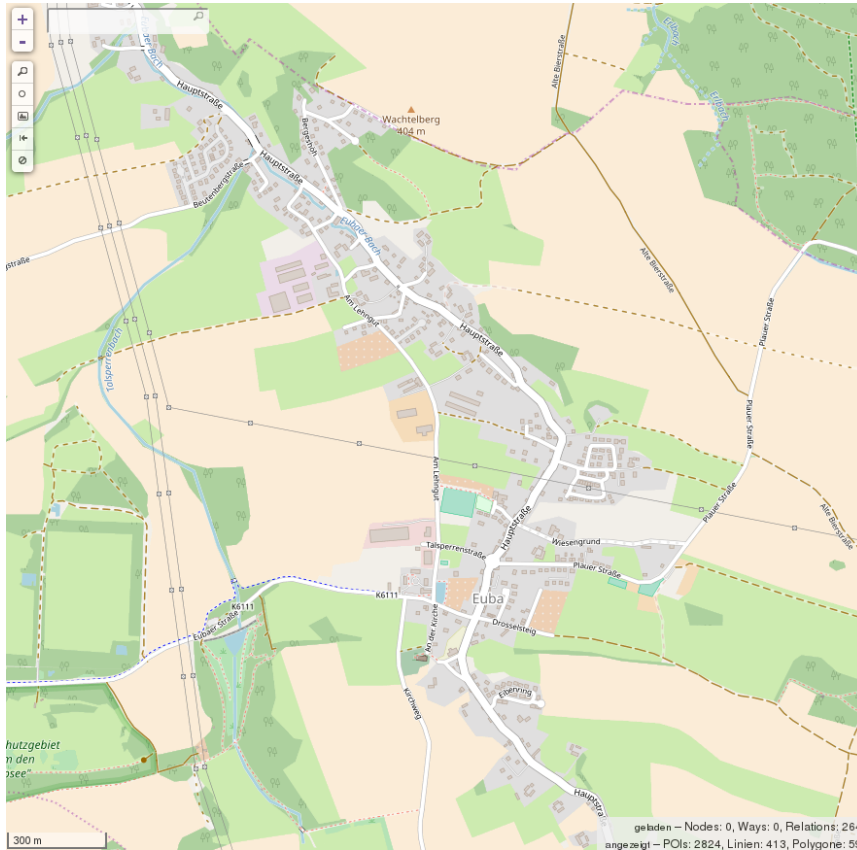


Größe: ca. 1,5 km x 1,5 km
Ways: 349,1 km Länge
Relations: 21.003,9 km Länge





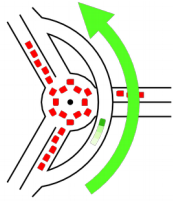
Relations



Größe: ca. 3 km x 3 km
Ways: 359,8 km Länge
Relations: **1.290,7 km Länge**



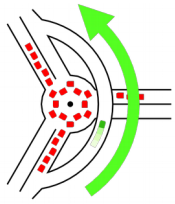
Größe: ca. 6 km x 6 km
Ways: 1.994,7 km Länge
Relations: **13.768,3 km Länge**



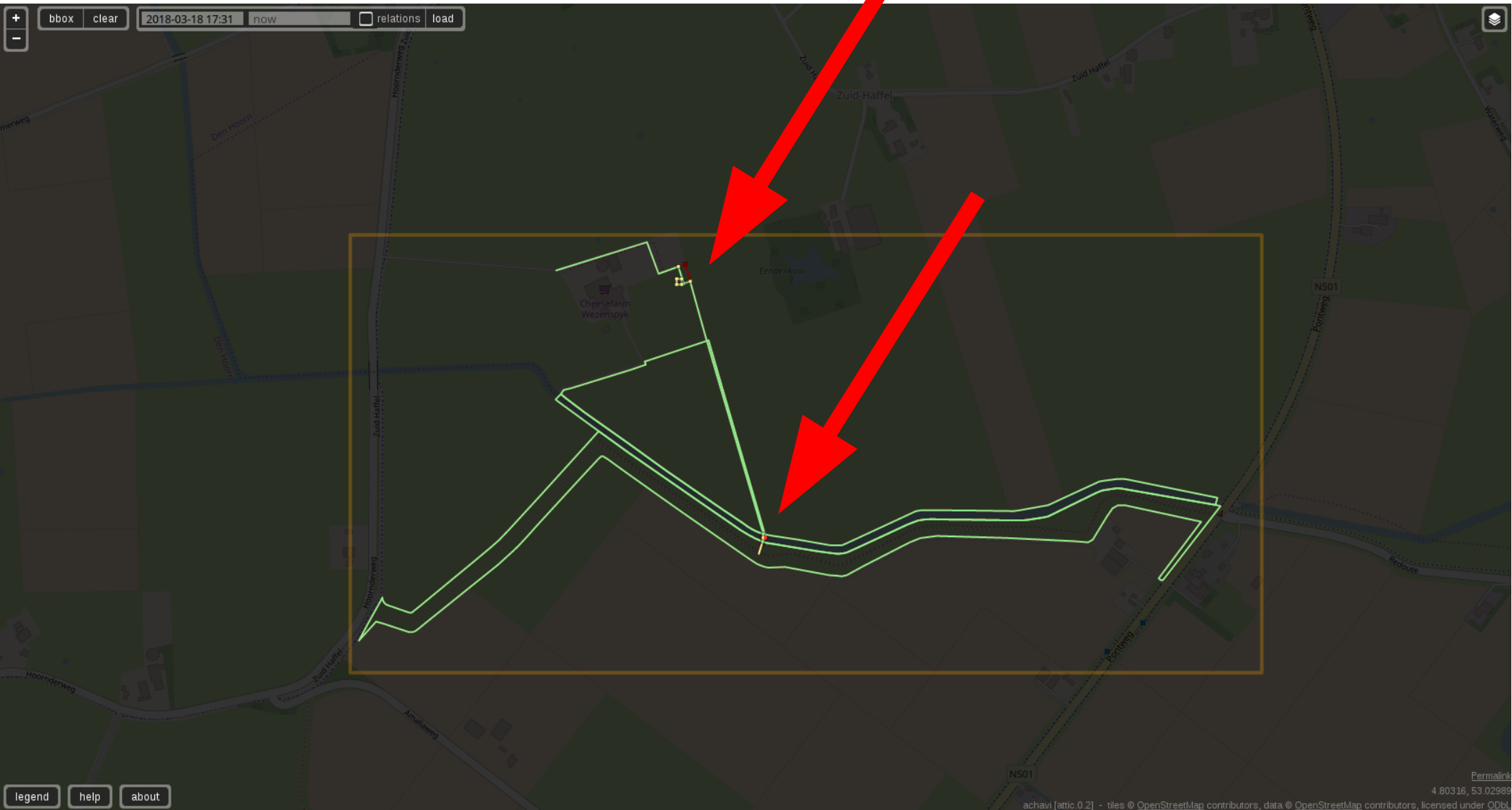
Relations

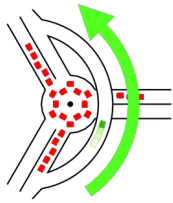
Änderungs-Häufigkeit von Relations:

Id	Version	Route	Ref	Name
27013	840	road	B 56	Bundesstraße 56
29891	1702	road		Bundesstraße 9
30908	470	train	RE 3	RE 3: Dresden => Freiberg => Chemnitz ...
67351	439	train	RE 3	RE 3: Hof => Plauen (V) => Zwickau => ...
2105830	482	road	B 173	B 173
2460773	601	bicycle	BI-1	Ciclovia del Sole
2759974	559	bicycle		EuroVelo 7 - part Italy

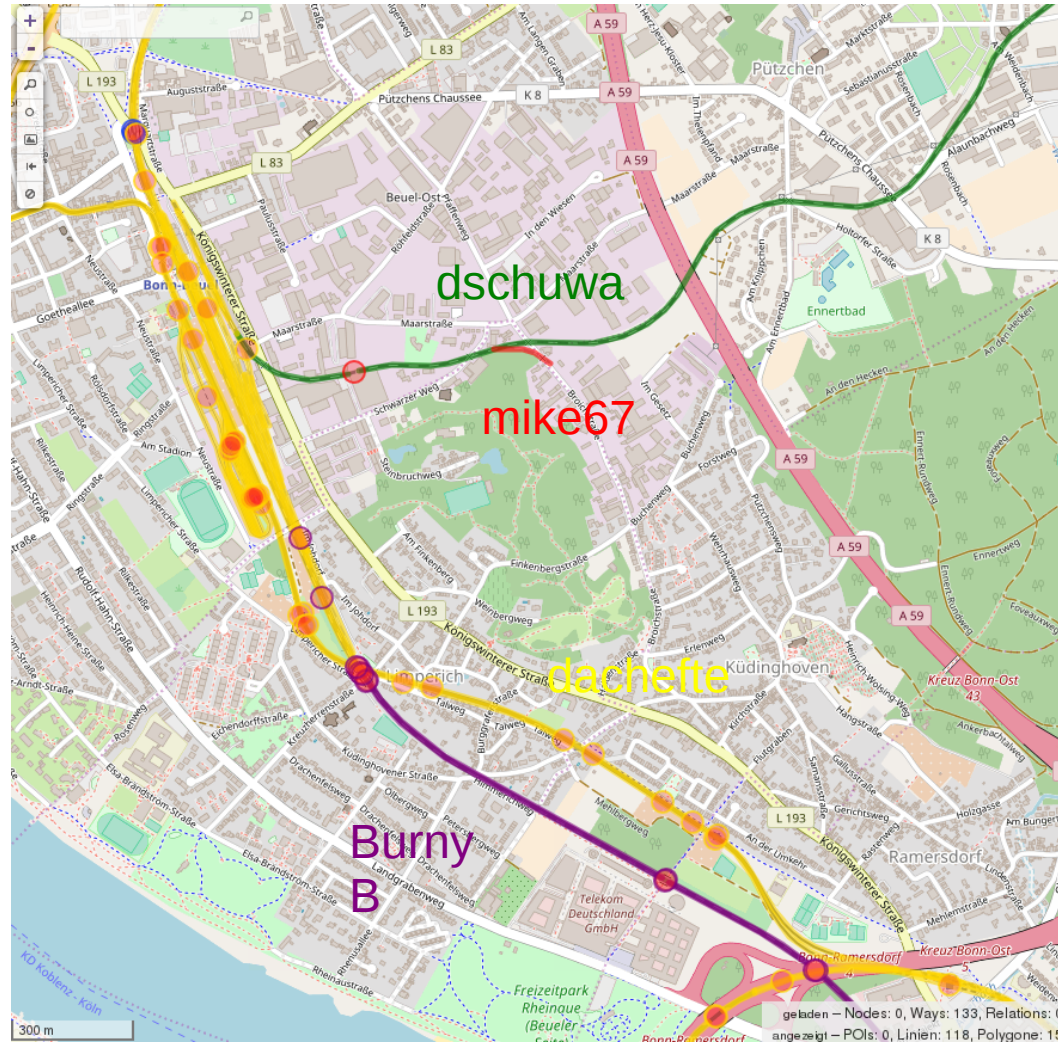


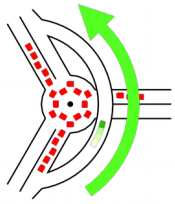
Echte Änderungen



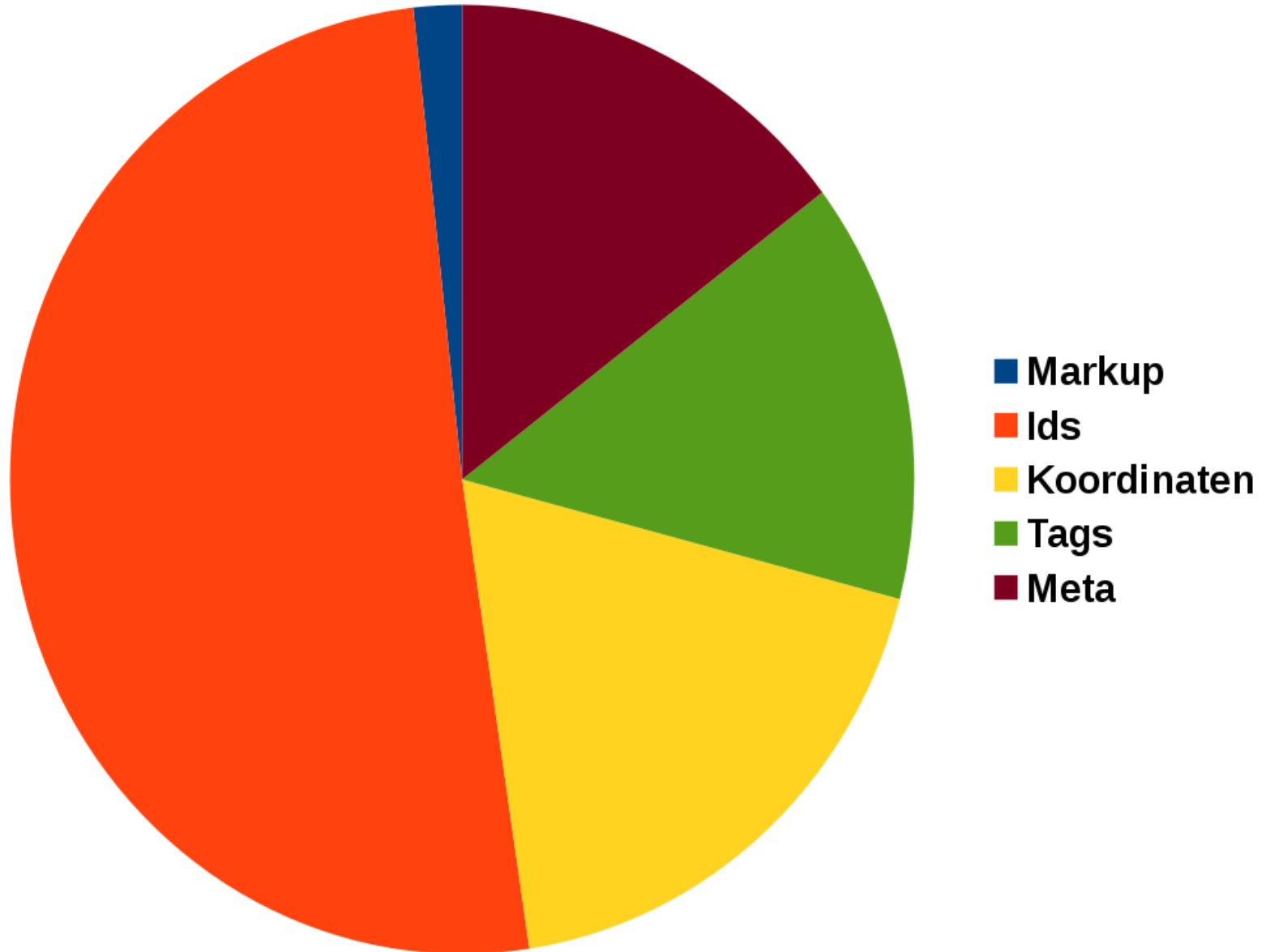


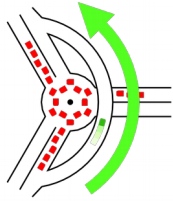
Git-Blame



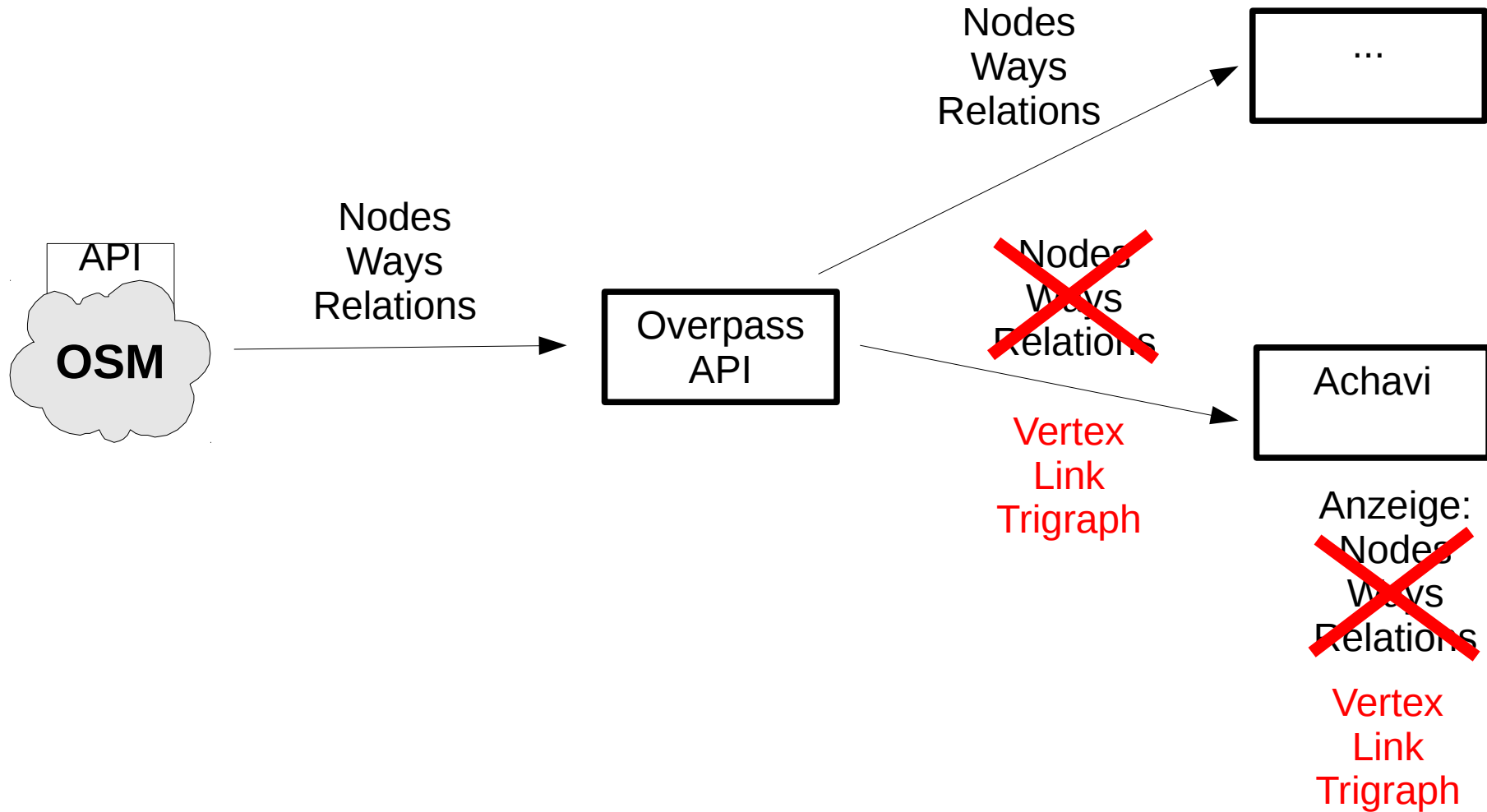


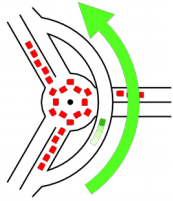
Änderungshäufigkeiten Datenmengen





Lösung: Vertex-Link-Trigraph





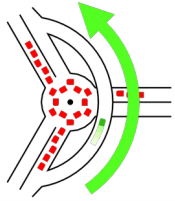
Lösung: Vertex

ist Koordinate, Id fällt weg,
nur getaggte Nodes werden gelistet

```
<vertex lat="50.8" lon="7.1" local_id="2">  
  <tag k="place" v="dummy"/>  
  <origin type="node" ref="1234"  
    changeset="666666"/>  
</vertex>
```

Andere Nodes? Implizit in Links!

Doppelte Position? local_id
(nur 25 in ganz Bonn, weniger als 0,1 %)
keine dreifachen Positionen



Lösung: Link

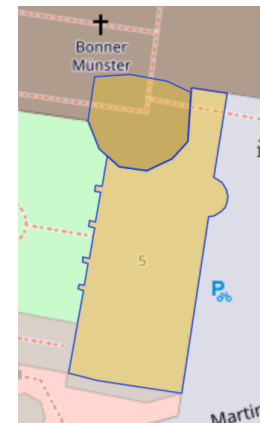
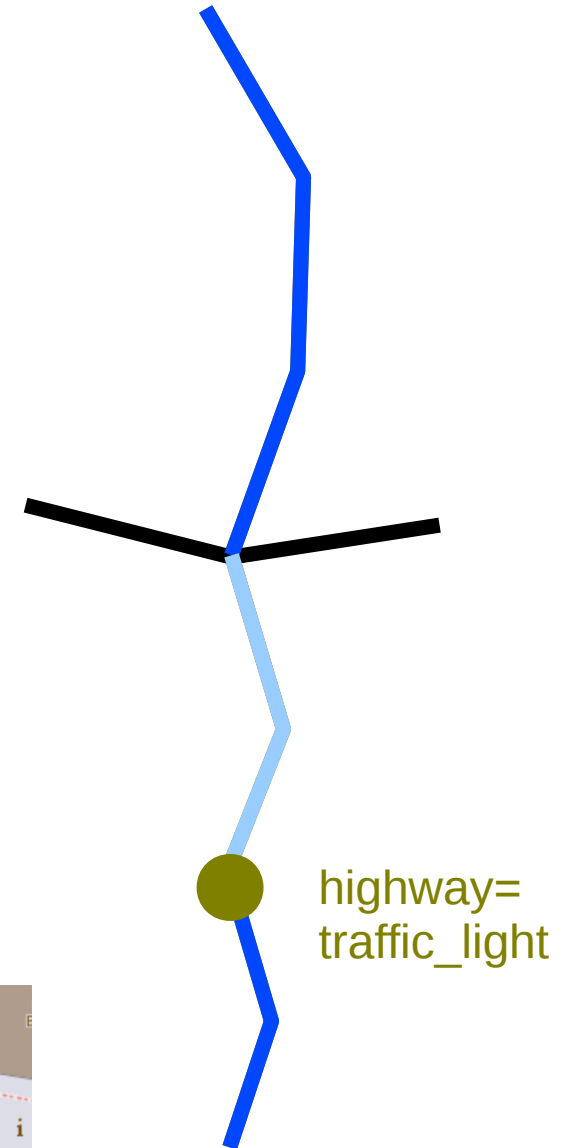
Ways zerlegen

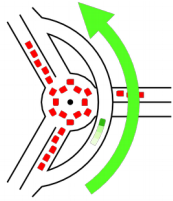
- an gemeinsamen Nodes mit anderen Ways
- an getaggten Nodes

```
<link local_to="2" local_id="2">  
  <vertex lat="50.81" lon="7.11"/>  
  <vertex lat="50.805" lon="7.105"/>  
  <vertex lat="50.8" lon="7.1"/>  
  <tag k="place" v="dummy"/>  
  <origin type="way" ref="567"/>  
</link>
```

```
<link>...</link>  
<link>...</link>
```

- bei Überlänge ?
- bei Schnittpunkten ohne Node ?
- Was tun mit überlappenden Ways ?



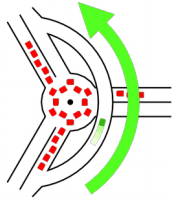


Lösung: Trigraph

- Zerlege Relations in einzelne Member!
- speichere Verweis auf Vorgänger
- speichere Verweis auf Nachfolger

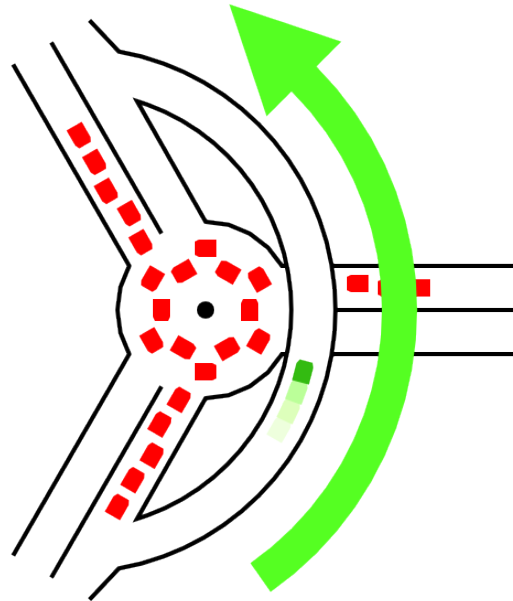
```
<trigraph>
  <group>
    <vertex lat="50.82" lon="7.11" local_id="1"/>
    <vertex lat="50.81" lon="7.11"/>
  </group>
  <group>
    <vertex lat="50.81" lon="7.11"/>
    <vertex lat="50.805" lon="7.105"/>
    <vertex lat="50.8" lon="7.1"/>
  </group>
  <group local_ref="2">
    <vertex lat="50.8" lon="7.1"/>
    <vertex lat="50.8" lon="7.09"/>
  </group>
  <tag k="route" v="dummy"/>
  <origin type="relation" ref="89"
    role="" member_type="way" member_ref="567"/>
</trigraph>
```

- Option: Flächen-Inneres kennzeichnen
- Richtung umkehren für durchgehenden Weg?



Ergebnis: weniger Beifang, Nur Noch Geändertes





Overpass API

Und nun: Beispiele