

KM4city URBAN GRAPH REPRESENTATION

TrafAir internal document

Author - Disit Lab

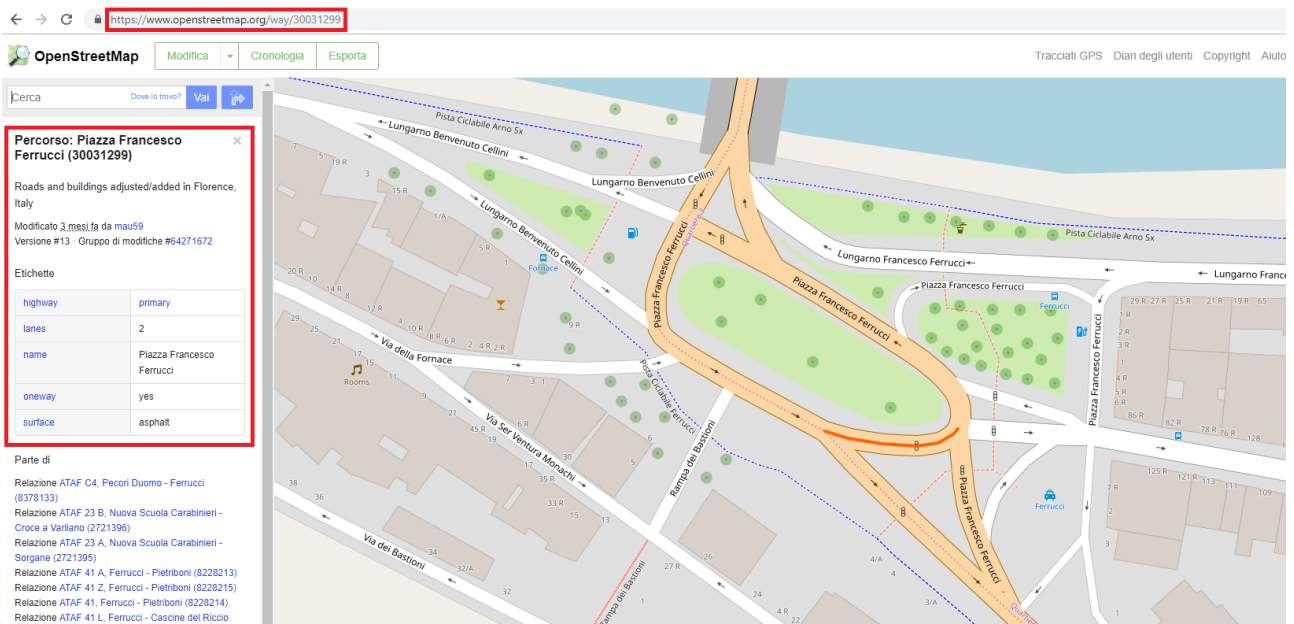
Starting from the OSM data and the KM4City Ontology (<http://www.disit.org/km4city/schema>), the Florence Graph has been created by Disit Lab. In this document some details are described.

A road network is studied as a directed graph composed by arcs that meet at some nodes, corresponding to road junctions. The urban roads' characteristics are stored in the OpenStreetMap database, for example:

- road type <https://wiki.openstreetmap.org/wiki/Key:highway>
- road lanes <https://wiki.openstreetmap.org/wiki/Key:lanes>
- etc.

Each road admits an initial node and an end node in order to determine the corresponding directed arc in the graph. In the following we consider an example.

Road 1 (labelled with OS00030031299SR, in OSM: <https://www.openstreetmap.org/way/30031299>):



Road 2 (labelled with os00026943048SR):

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Cerca Dove lo trovi? Vai

Percorso: Piazza Francesco Ferrucci (26943048)

Avanzamento linee autobus ATAF 8, 12, 13, 14, 23
Firenze

Modificato 5 mesi fa da hypersciocco
Versione #13 - Gruppo di modifiche #62010403

Etichette

highway	primary
lanes	2
name	Piazza Francesco Ferrucci
oneway	yes

Parte di

- Relazione ATAF C4, Presidio Ospedaliero Palagi - Pecori Duomo (8478638)
- Relazione ATAF 12, Piazzale Michelangelo - Il Prato Barbelli (2737049)
- Relazione 7410682 (come from)

Road 3 (labelled with os00205385722SR):

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Cerca Dove lo trovi? Vai

Percorso: Piazza Francesco Ferrucci (205385722)

Avanzamento linee autobus ATAF 8, 12, 13, 14, 23
Firenze

Modificato 5 mesi fa da hypersciocco
Versione #4 - Gruppo di modifiche #62010403

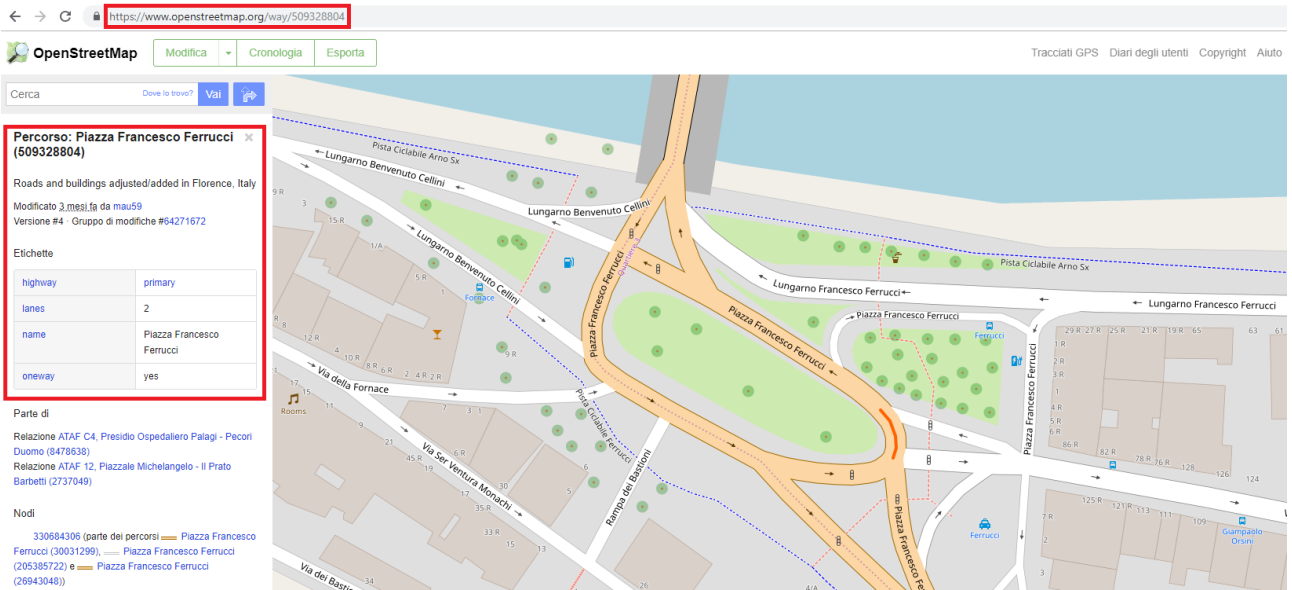
Etichette

highway	tertiary
name	Piazza Francesco Ferrucci
oneway	yes

Parte di

- Relazione ATAF C4, Pecori Duomo - Ferrucci (8378133)
- Relazione ATAF 23 B, Nuova Scuola Carabinieri - Croce a Variano (2721396)
- Relazione ATAF 23 A, Nuova Scuola Carabinieri - Sorgane (2721395)
- Relazione ATAF 41 A, Ferrucci - Pietriboni (8228213)
- Relazione ATAF 41 Z, Ferrucci - Pietriboni (8228215)
- Relazione ATAF 41 F, Ferrucci - Pietriboni (8228214)
- Relazione ATAF 41 L, Ferrucci - Cascine del Riccio (8228212)

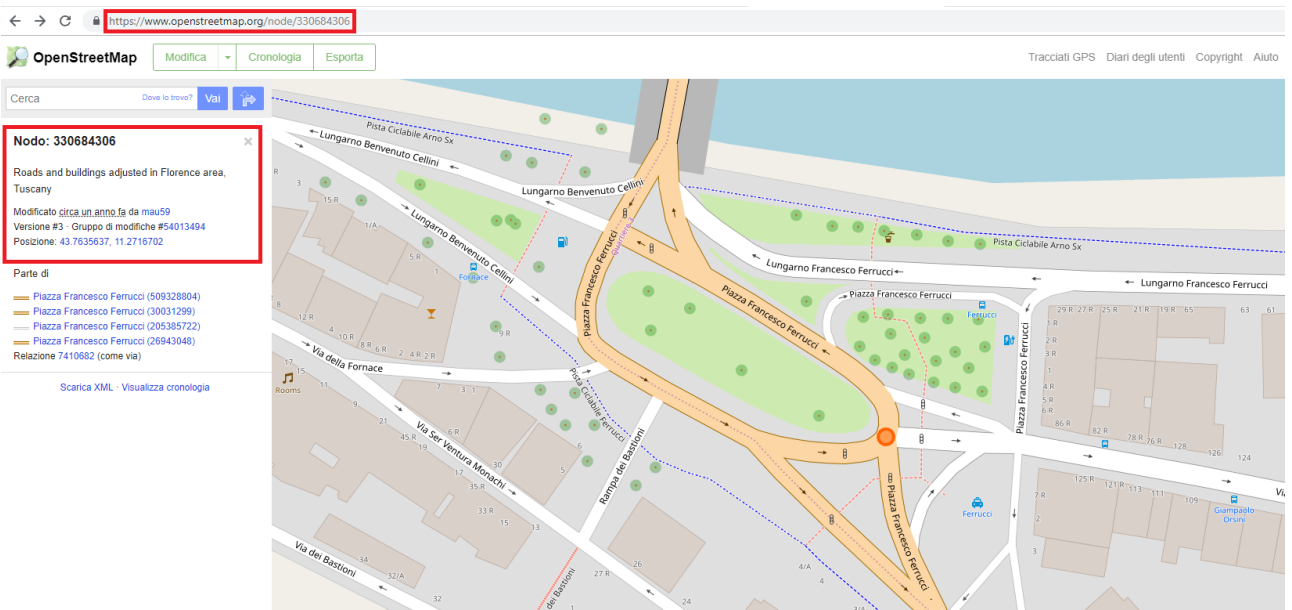
Road 4 (labelled with OS00509328804SR):



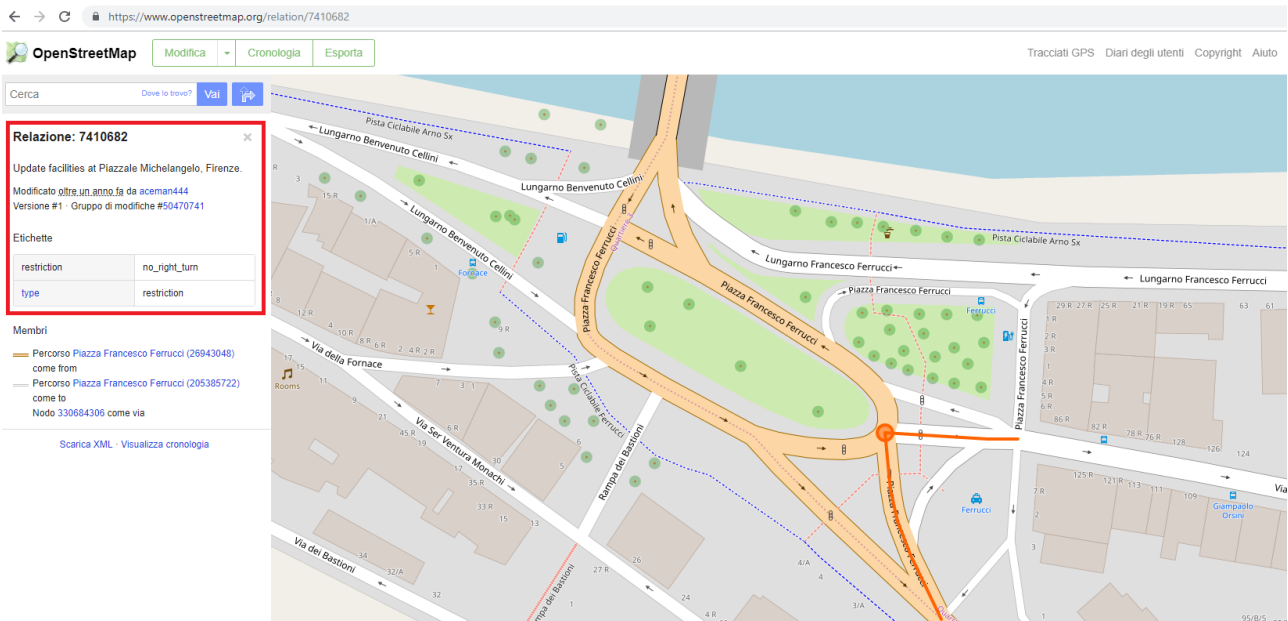
Listing the previous road-segments with their initial (nodeA, see the following table) and end node (nodeB, see the following table), the related road junction *J* (labelled with OS00330684306NO) is implicitly determined by means of the corresponding incoming and outgoing road-segments. In particular, the incoming road-segments in the road junction *J* are the road-segments having *J* as their end node, while the outgoing road-segments in the road junction *J* are the road-segments having *J* as their initial node (road details can be found in *roadDetails.xlsx* file coming from the ingestion process).

nodeA	segment	length	road	nodeB
OS01344583128NO	OS00030031299RE/4	4	OS00030031299SR	OS00330684306NO
OS00295213650NO	OS00026943048RE/5	8	OS00026943048SR	OS00330684306NO
OS00330684306NO	OS00205385722RE/0	29	OS00205385722SR	OS04985765666NO
OS00330684306NO	OS00509328804RE/0	3	OS00509328804SR	OS05200009916NO

Road Junction node (labelled with OS00330684306NO):



Moreover, further relations can be considered at the given junction (for example, representing the related turn restriction <https://wiki.openstreetmap.org/wiki/Relation:restriction>). In the example, *no_right_turn* restriction from road-segment labelled with **26943048** to road-segment labelled with **205385772** is considered.



node	from	to	restriction
OS00330684306NO	OS00026943048RE/5	OS000205385772RE/0	no_right_turn