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Attribute Conflation

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Attribute Conflation – Hootenanny Conflation Review

- Conflation is pairwise with one input dataset referred to as the reference dataset and the other as the secondary dataset
- Conflation can roughly be separated into the phases:
  - Cleaning
  - Matching
  - Merging
  - Rejoining
- Goals:
  - Correctly merge together OR flag for review matching feature pairs between two datasets
  - Shoot for >90% accuracy of merged + reviews combined (>95% is great)
  - Expect human intervention to clean up remaining unmatched and reviewed features
  - Strive to keep the number of reviews as low as possible and make them intuitive
- Reviews are meant to be distributed amongst multiple individuals

Attribute Conflation – Supported Feature Types

- Area polygons
- **Building** polygons
- Points of Interest (POIs)
- Transportation polylines (**roads** and railways)
- Utility polylines (power lines)
- Waterway polylines

Attribute Conflation – Conflation Workflows 1

- Reference Conflation (default)
  - Merge best geometry and tags from secondary data into reference
  - Always favor the reference data
  - When to use:
    - You want to enhance you reference dataset with the best parts of your secondary dataset
    - You're willing to accept some changes to your reference dataset
- Horizontal Conflation (aka Cookie Cutter)
  - Define a specific region in the reference modified not to be modified
  - Stitch in data from the secondary map around the reference map
  - When to use:
    - Your reference dataset is superior in every way to the secondary dataset in a certain region only

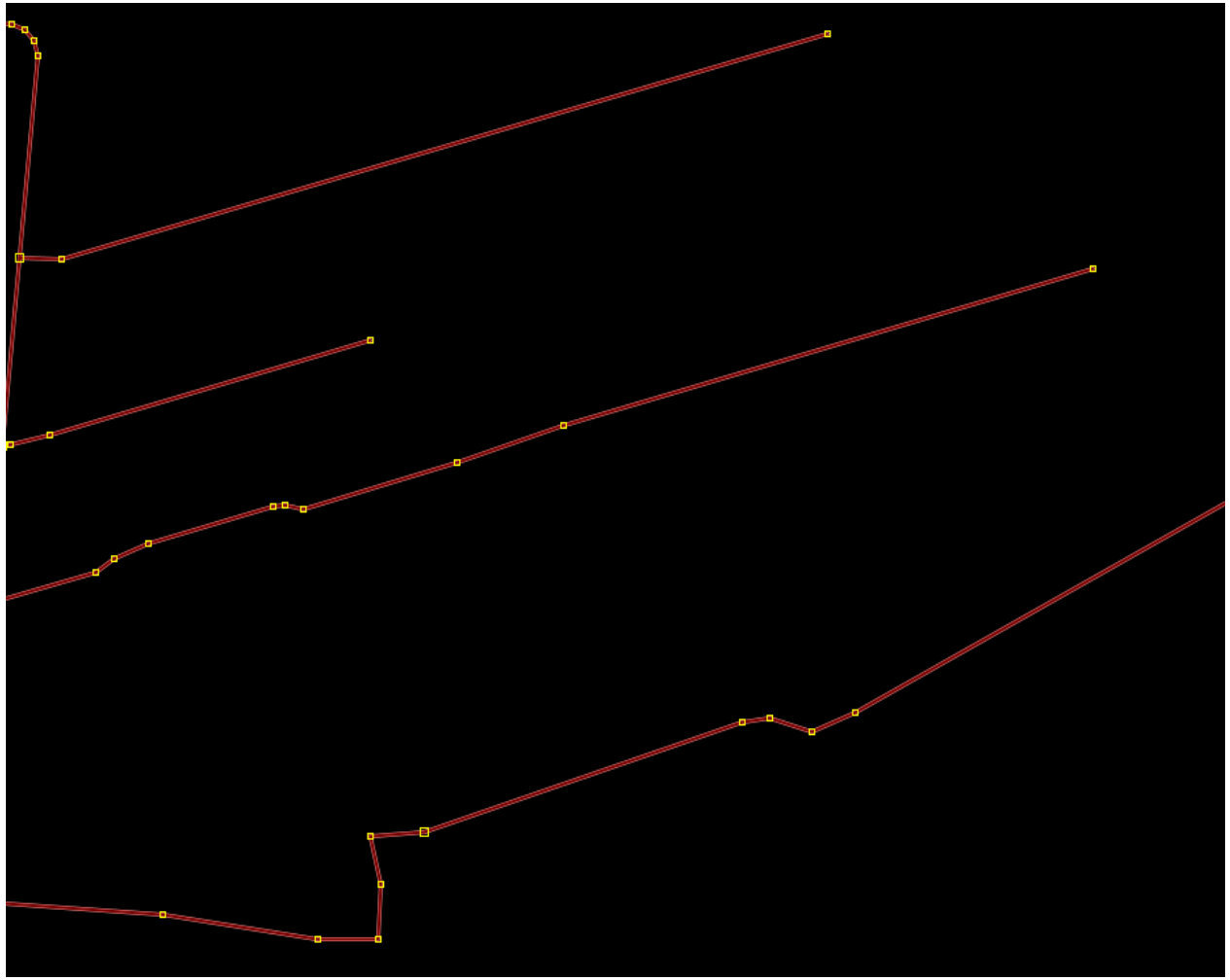
Attribute Conflation – Conflation Workflows 2

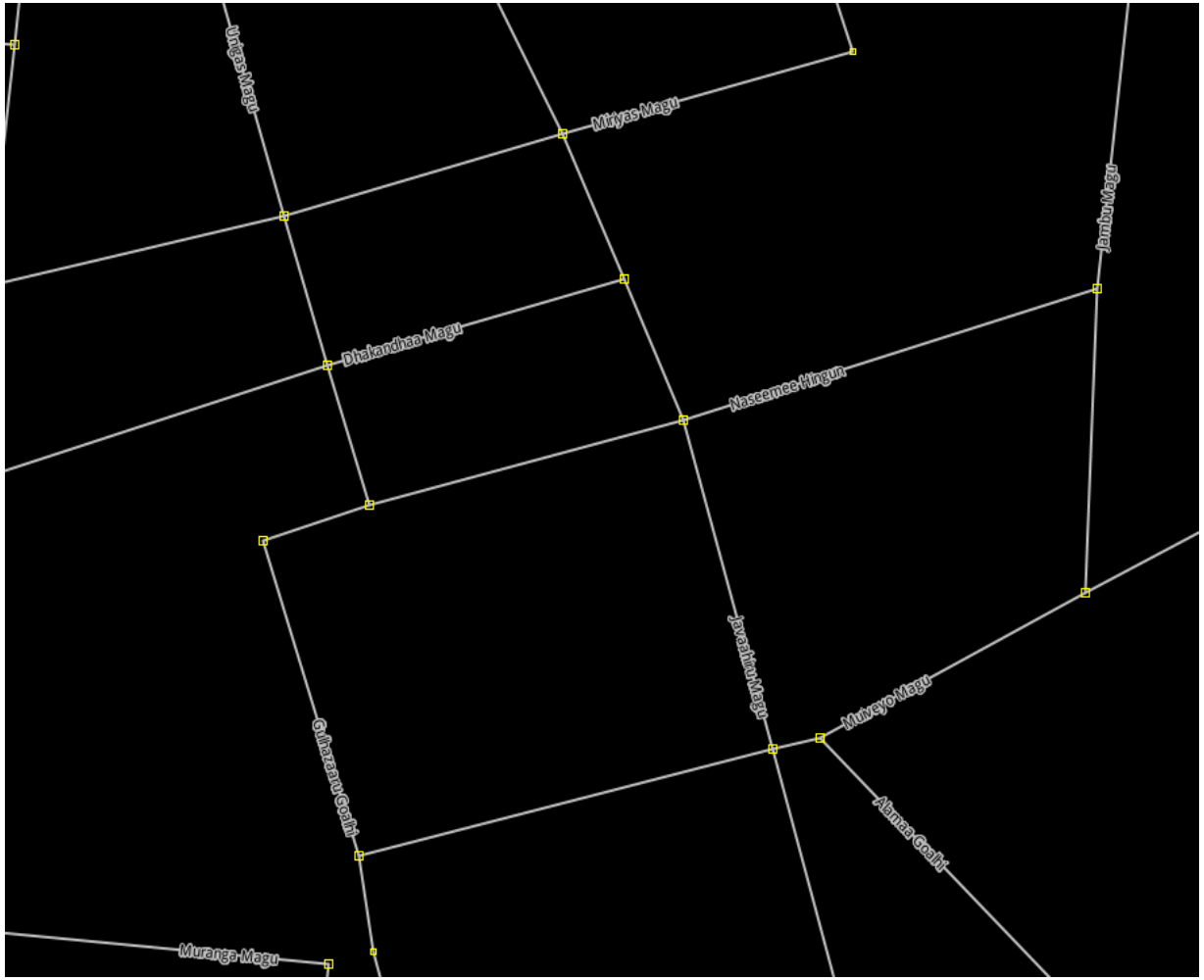
- Differential Conflation
  - Only add in the features from the secondary dataset that are not present in the reference dataset
  - Optional tag overwriting from the secondary to reference is also available
  - When to use:
    - Your reference dataset is superior in every way to the secondary dataset in all areas, and you just want to enhance it
- **Attribute Conflation**
  - **Transfer all tags from the secondary dataset to the reference dataset**
  - **Do not change the reference dataset geometry (with some configurable exceptions)**
  - **When to use:**
    - **Your reference dataset geometry is superior but the secondary dataset tags are superior**

Attribute Conflation - Details

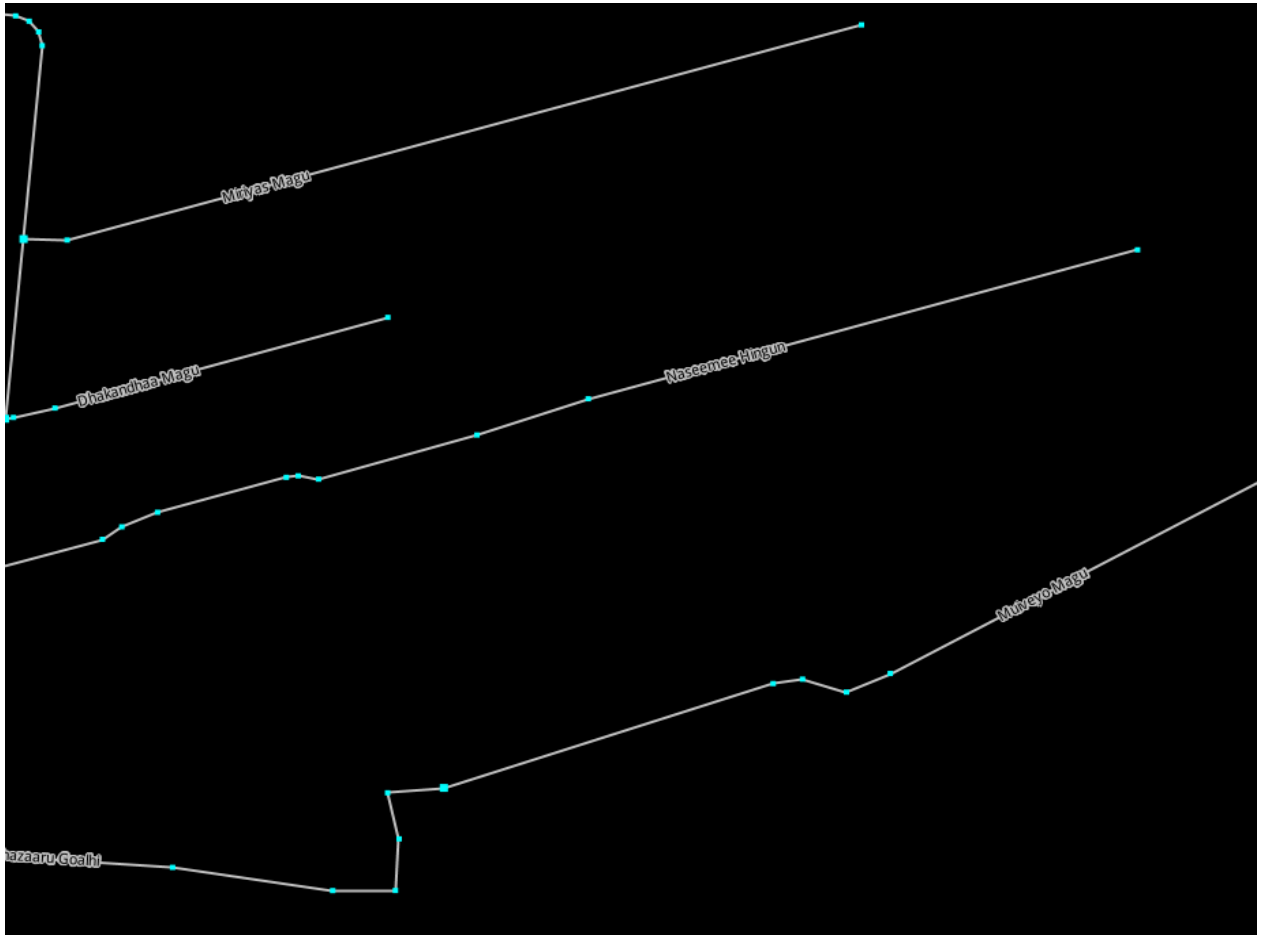
- Attribute Conflation uses much of the matching logic from the Unifying Roads Algorithm (aka 2nd Generation Roads Algorithm)
- AC uses a custom merging routine
- Post conflation feature rejoining routine is custom to AC and parts may be useful to other conflation workflows
- Most AC conflation challenges are due to:
  - Reference data having a less detailed geometry
  - Lack of attribution in reference data sometimes makes correct output difficult to discern

Attribute Conflation – Example Inputs

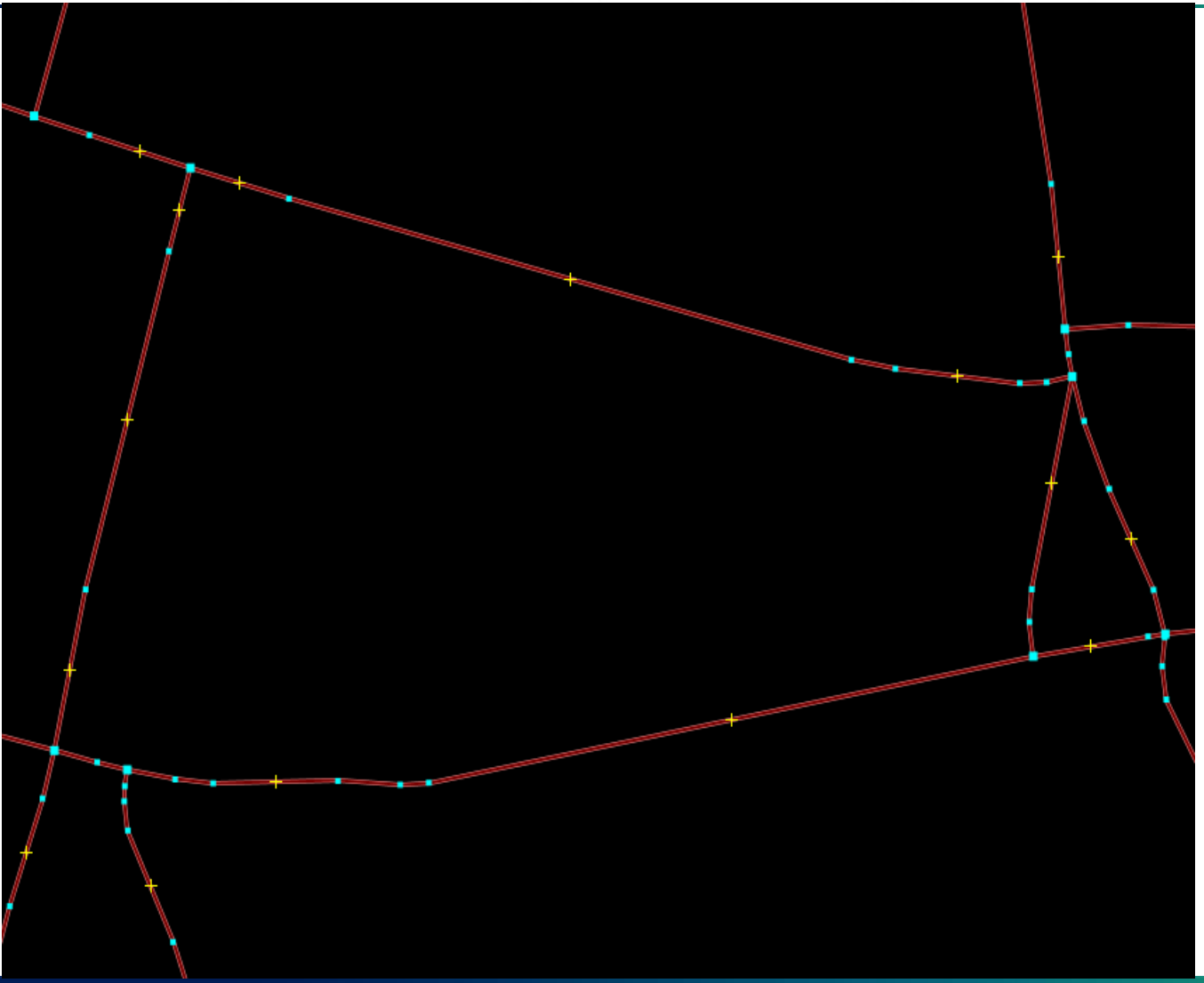


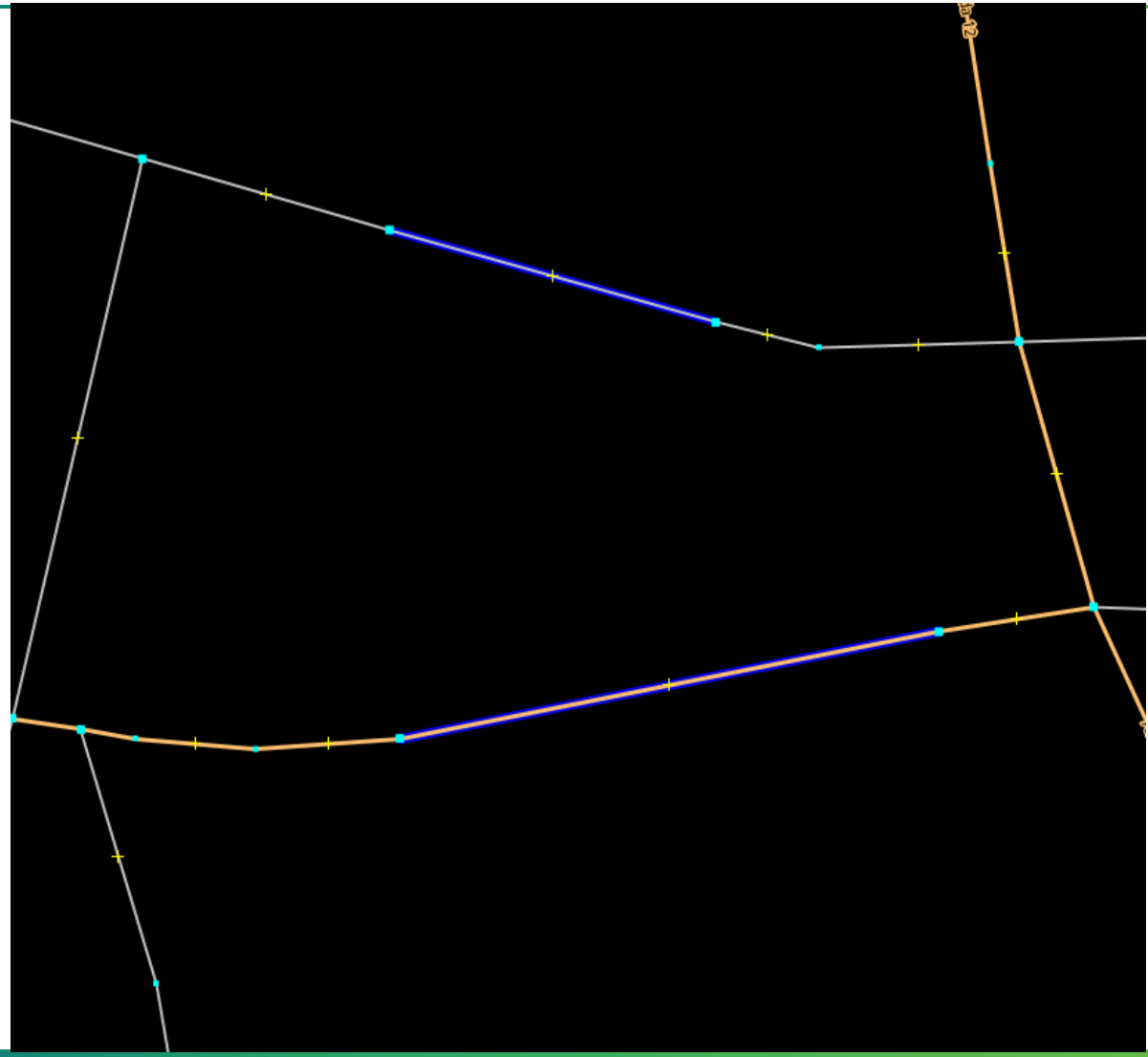


Attribute Conflation – Example Conflated Output

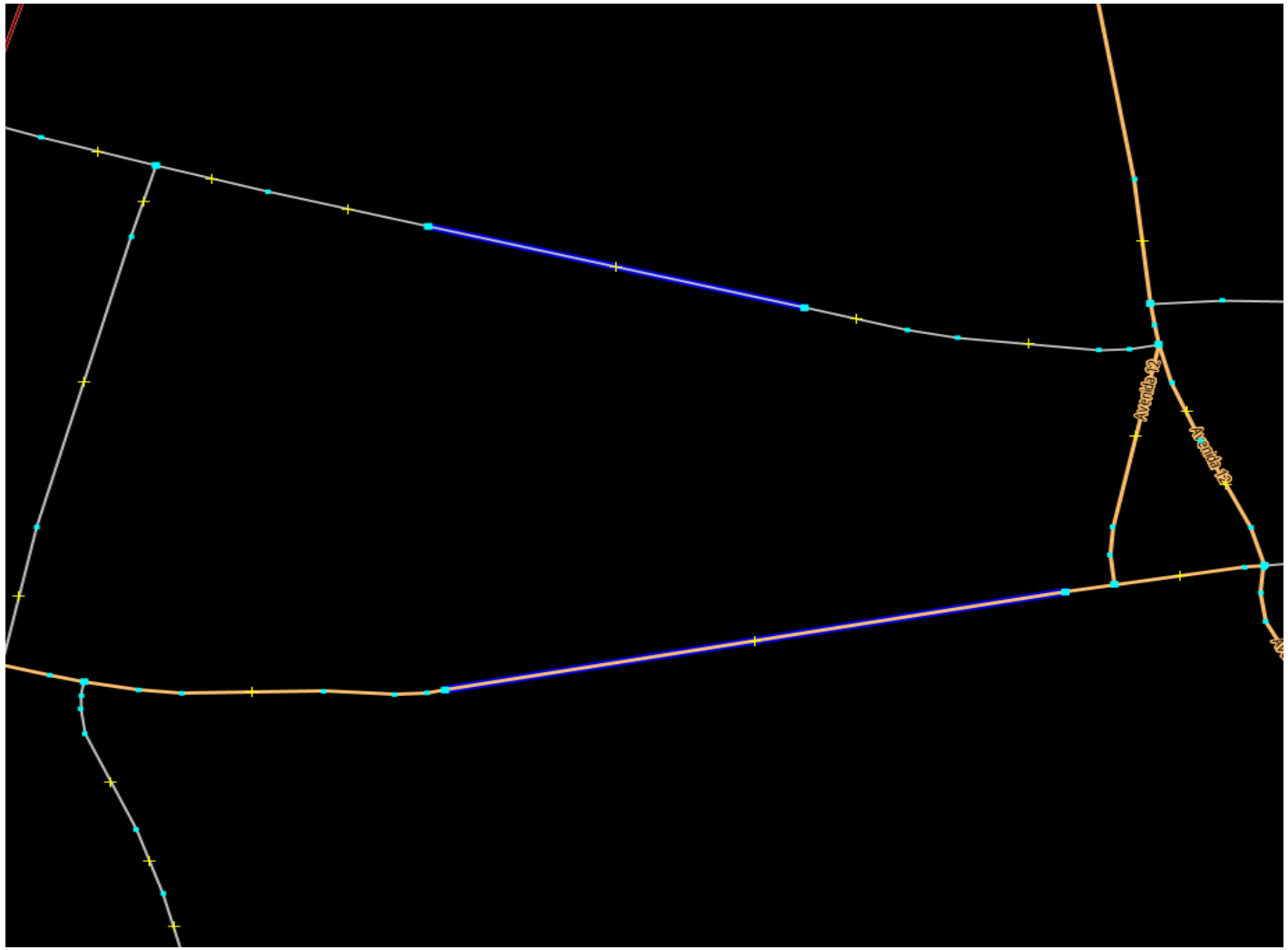


Attribute Conflation – Challenges: Bridge Inputs

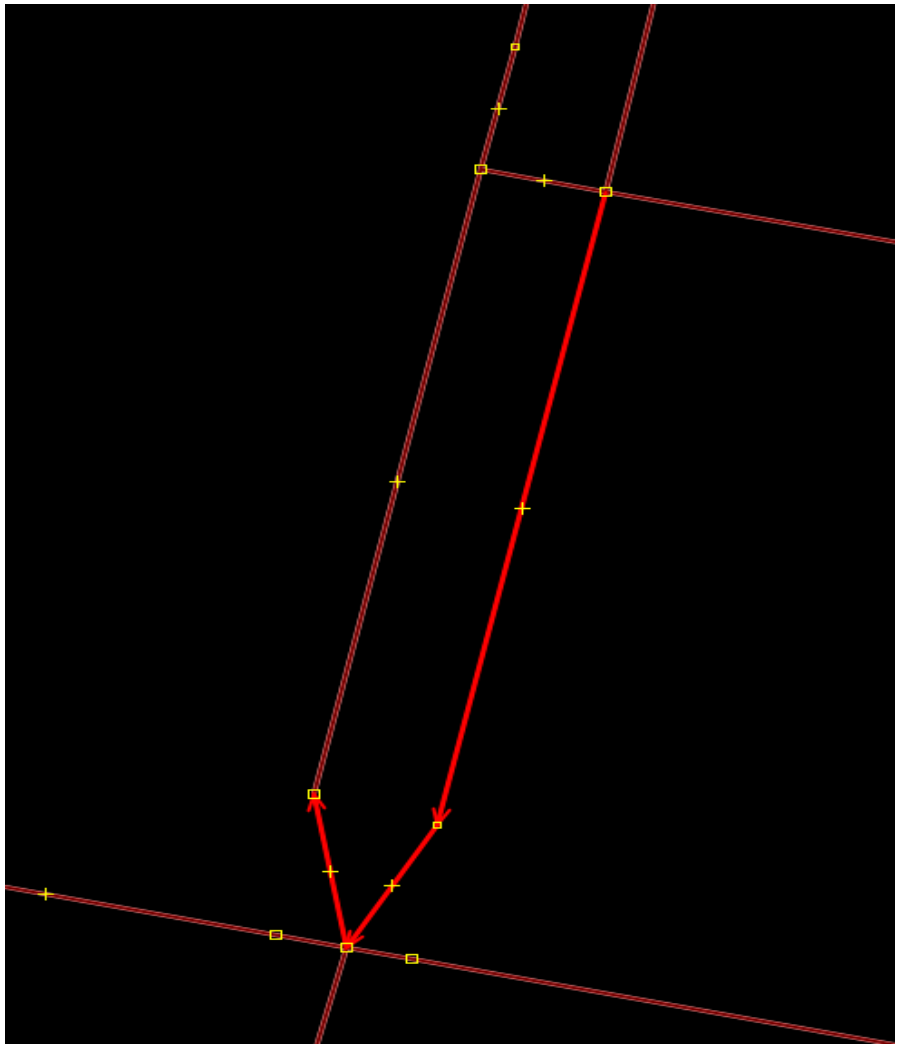


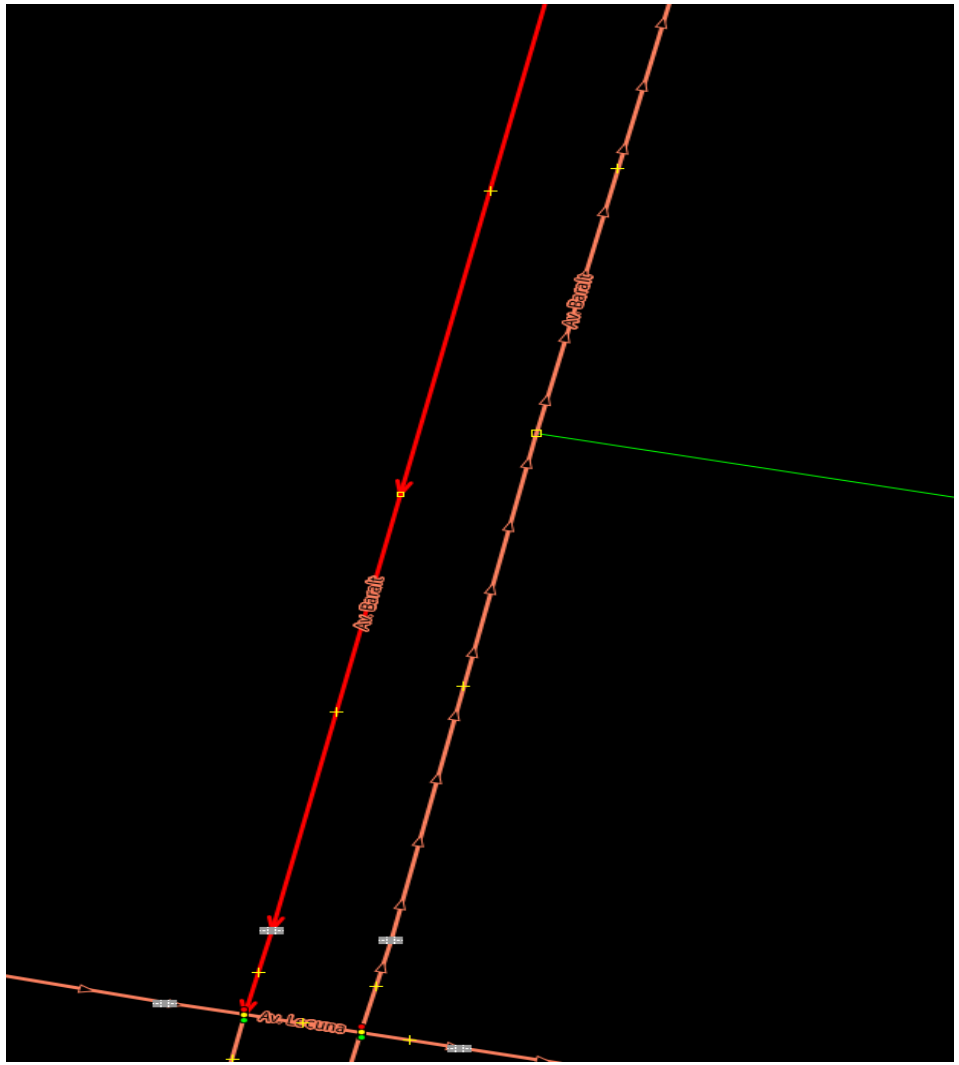


Attribute Conflation – Challenges: Bridge Output



Attribute Conflation – Challenges: Differing Geometries Inputs 1





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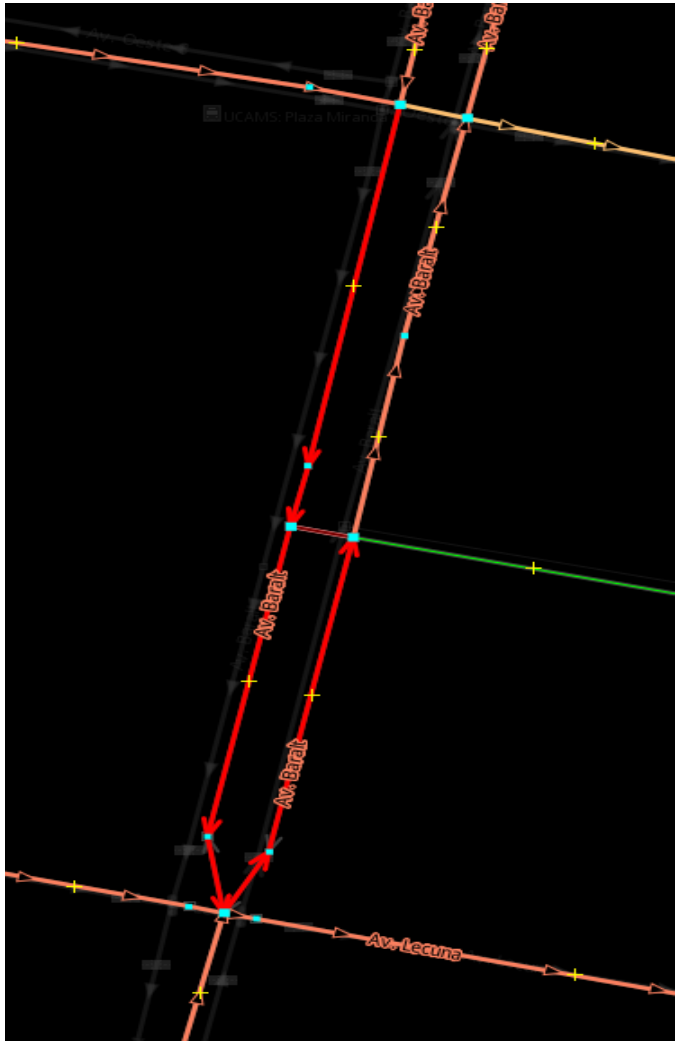
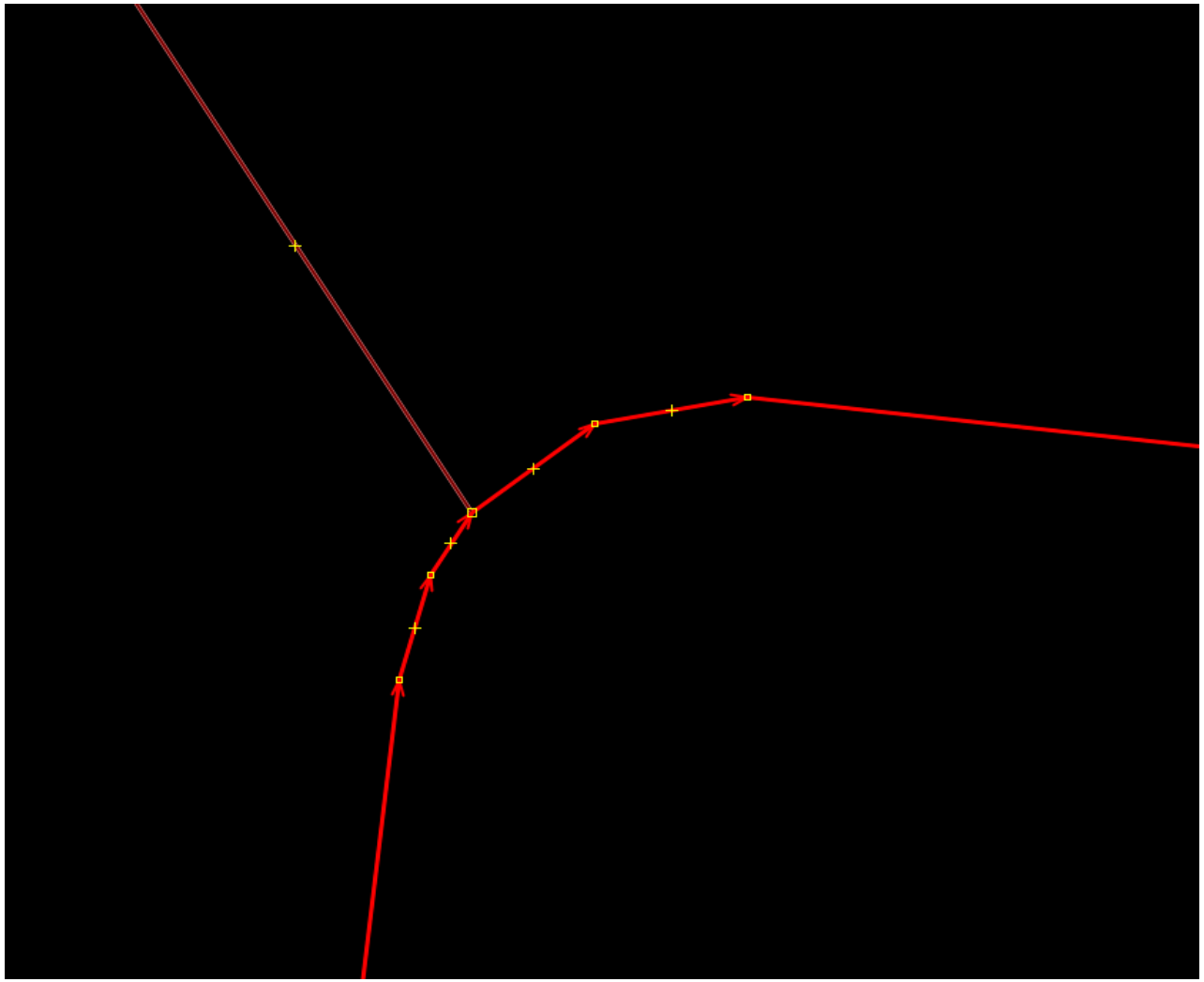
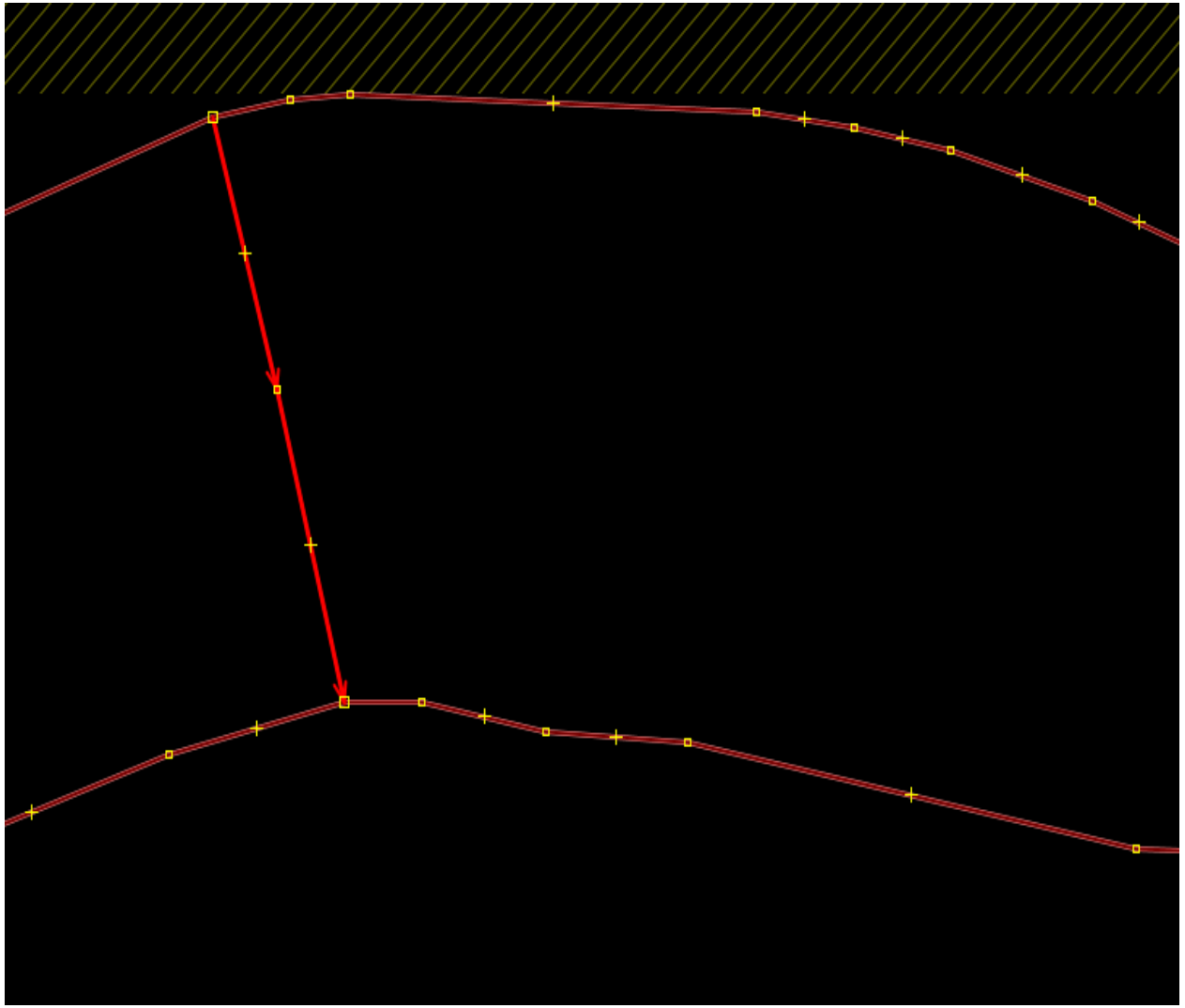


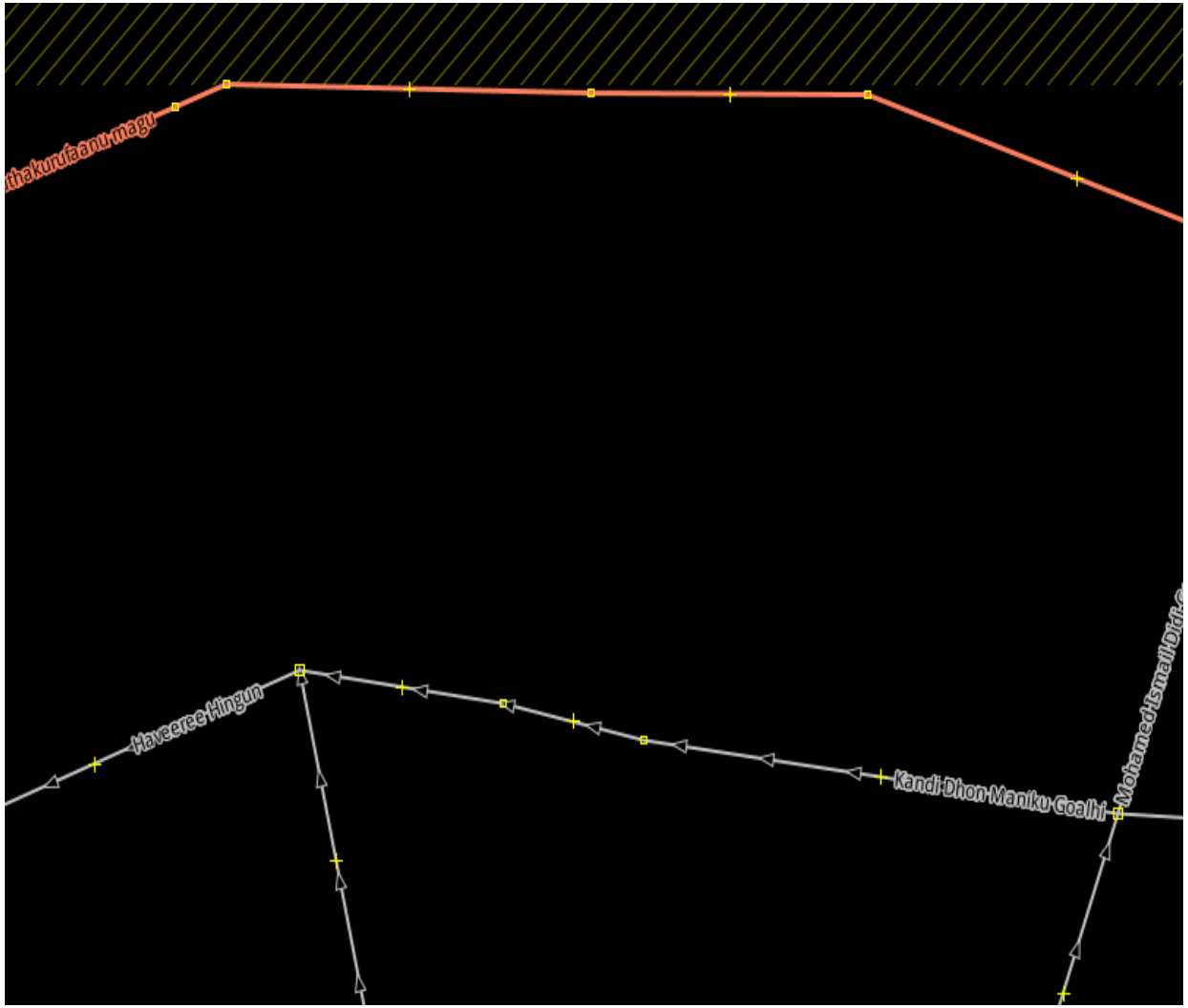
Attribute Conflation – Challenges: Differing Geometries Inputs 2



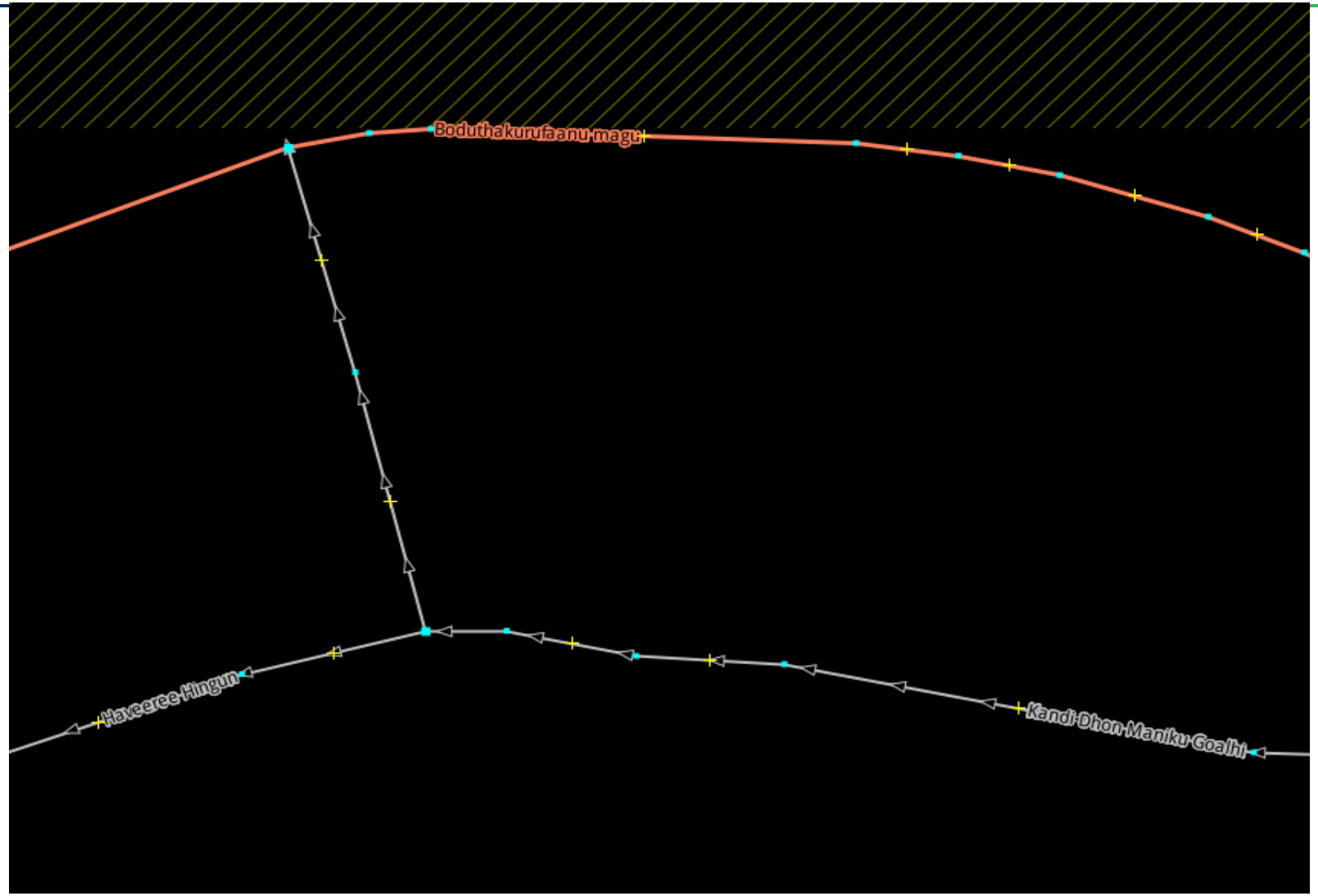
Attribute Conflation – Challenges: Differing Geometries Output 2

Attribute Conflation – Challenges: One-Way Street Inputs

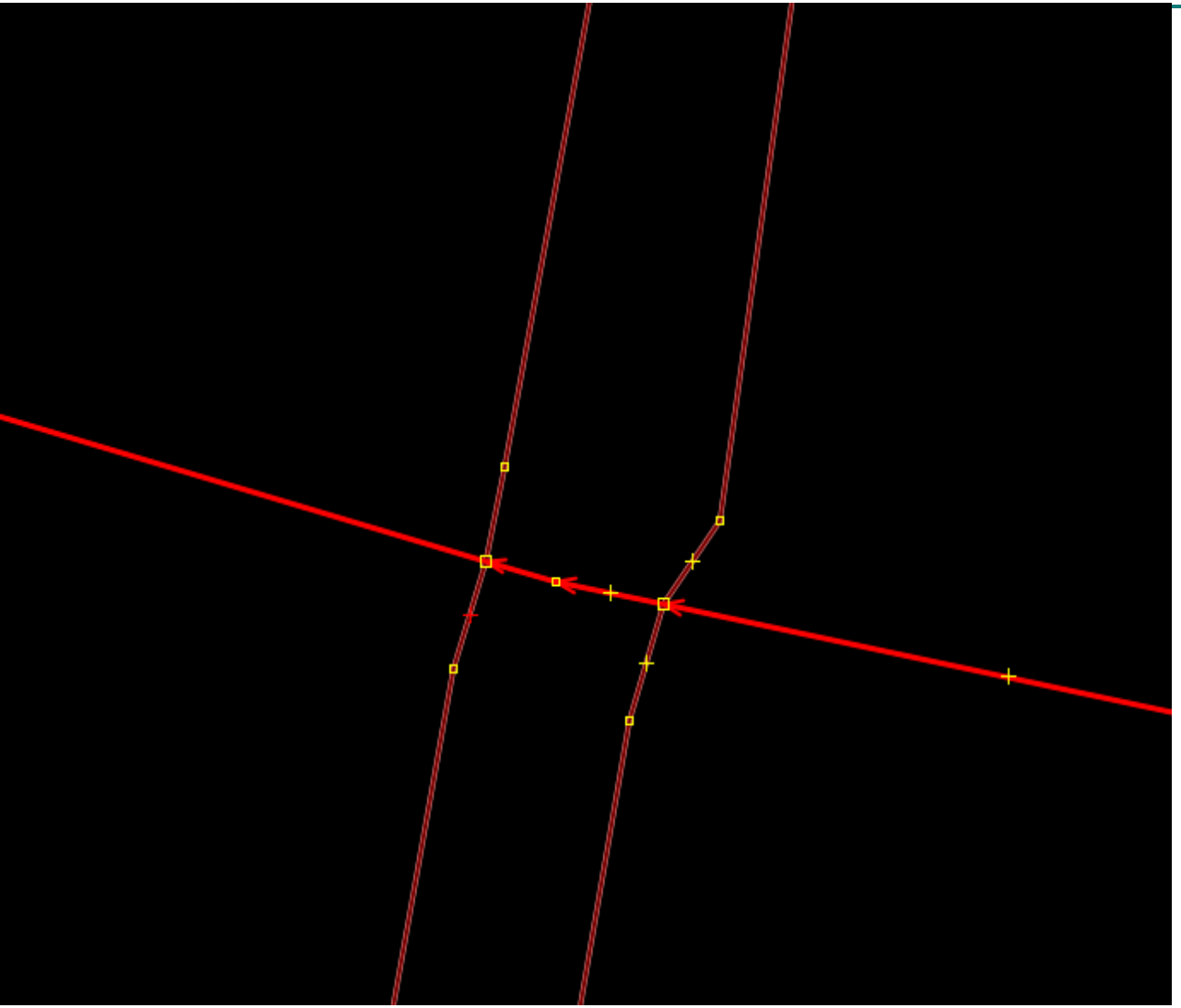


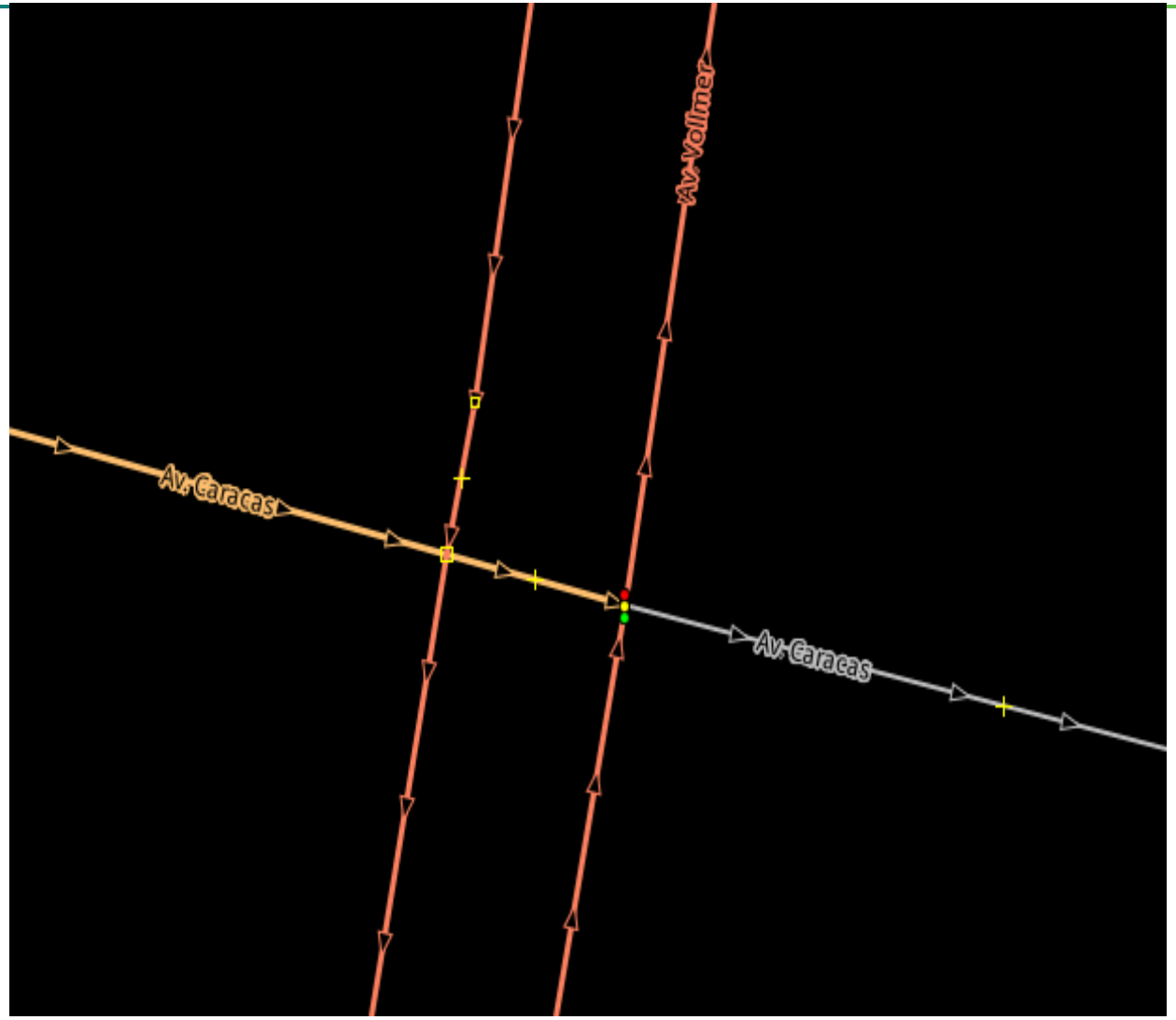


Attribute Conflation – Challenges: One-Way Street Outputs

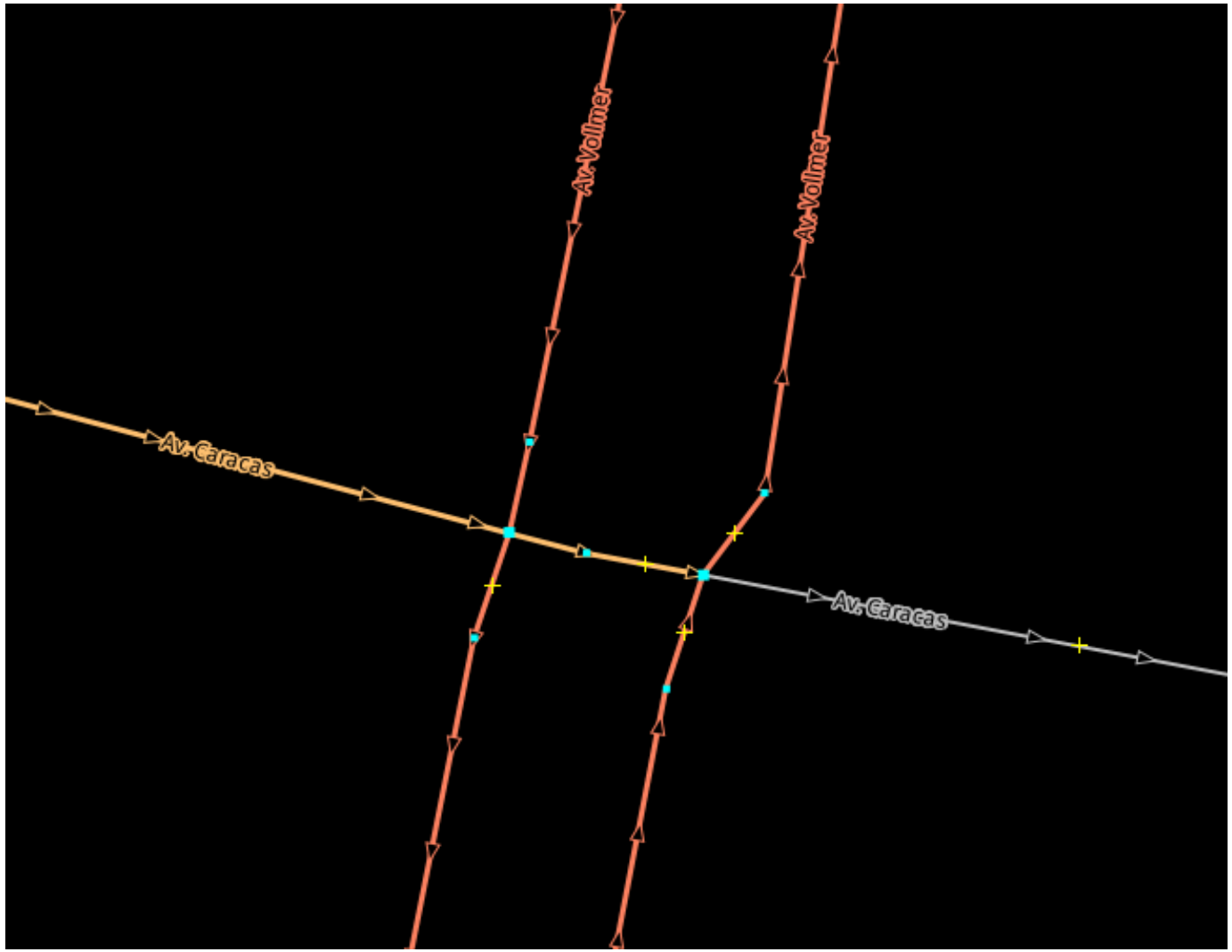


Attribute Conflation – Challenges: Road Type Preservation Inputs





Attribute Conflation – Challenges: Road Type Preservation Output



Attribute Conflation – Additional Capabilities

- Allow for optionally returning reviews within a custom review score threshold
  - Turned off by default
- Custom building merging
  - Only a multipolygon relation is created for the building in Attribute Conflation
  - Building conflation with other workflows creates both a multipolygon and building relation
- Aggressive road joining
  - Turned off by default
  - Option disabled results in fewer road type and name tag transfers from secondary to reference at the cost of more unattributed road segments in the output
  - Option enabled results in more road type and name tag transfers from secondary to reference at the cost of some incorrect tag transfers
- All above options will be available in Hoot UI 2.0 only

Attribute Conflation – Future Work

- Compare road results using the Network Roads Algorithm
- Continue working through identified problem areas
- May need to rewrite the matching routines to get to the next level of quality for AC