

Beyond Road Extraction: A Dataset for Map Update using Aerial Images

Supplementary Material

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This supplementary material is organized as follows:

- In Section 1, we show various summary statistics about the MUNO21 dataset.
- In Section 2, we show precision-recall curves where recall is measured in terms of PixelF1 Improvement.
- In Section 3, we discuss the performance of baseline methods where the map fusion strategy is not employed.
- In Section 4, we show examples of map update scenarios in the MUNO21 test set, along with outputs of map update methods on those scenarios.

1. Dataset Statistics

In Table 1, we show the number of scenarios with each tag in the training and test sets of MUNO21. These numbers add up to more than the total since some scenarios have multiple tags.

Table 1. The number of scenarios with each tag in the training and test sets of MUNO21.

Tag	Training Set	Test Set
No-Change	400	380
Constructed	102	62
Was-Missing	166	93
Deconstructed	23	25
Was-Incorrect	66	34
Total	726	568

2. PixelF1 Results

We show precision-recall curves where recall is measured in terms of PixelF1 Improvement in Figure 1.

3. Performance Without Fusing

In the results both in the paper and in Figure 1 in this supplementary material, we report the performance of previous road extraction methods (RoadTracer, RecurrentUNet,

Sat2Graph, and RoadConnect) only in combination with our map fusing strategy. However, we could apply those methods independently on MUNO21. We have omitted these results since the outputs of all four road extraction methods without map fusing yield a recall of 0 (indicating the inferred map \hat{G} deteriorates the base map G) and precision less than 25%.

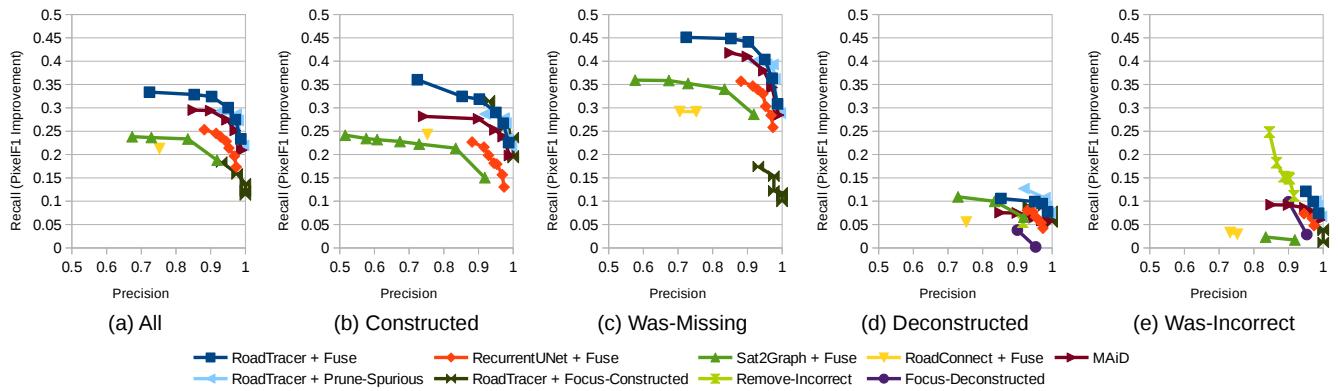
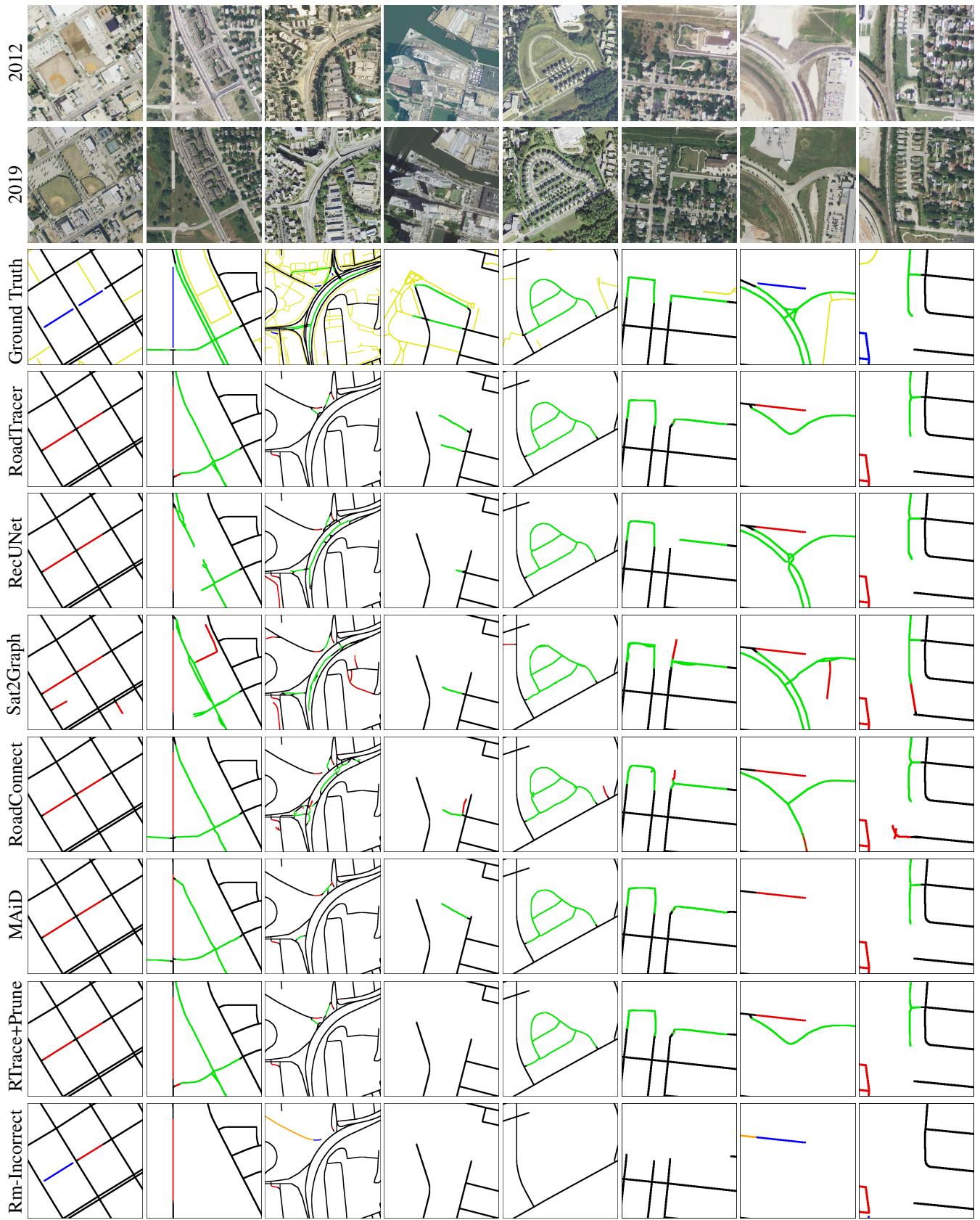


Figure 1. Precision-recall curves on the MUNO21 test set, where recall is measured in terms of PixelF1 Improvement.

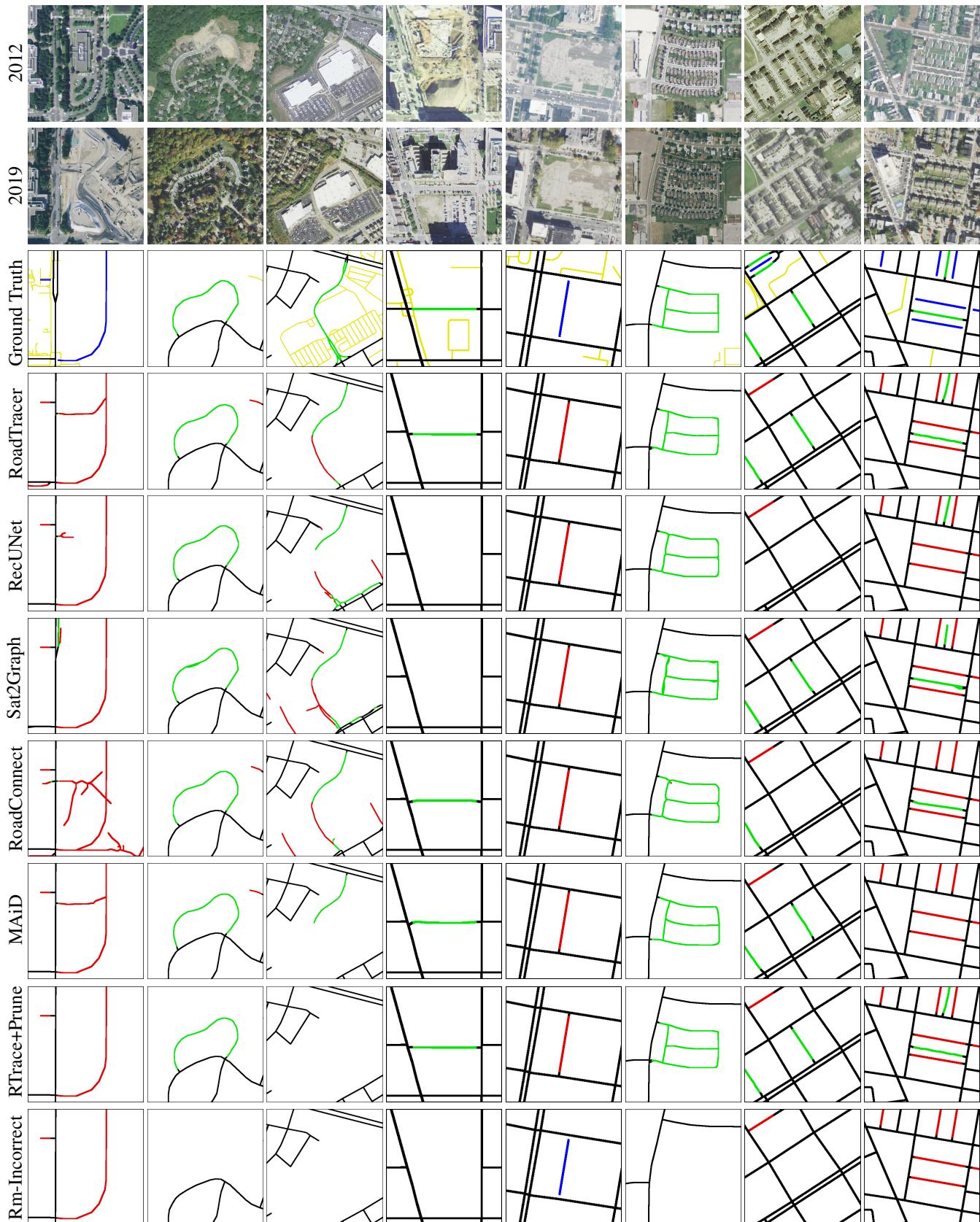
4. Map Update Scenarios

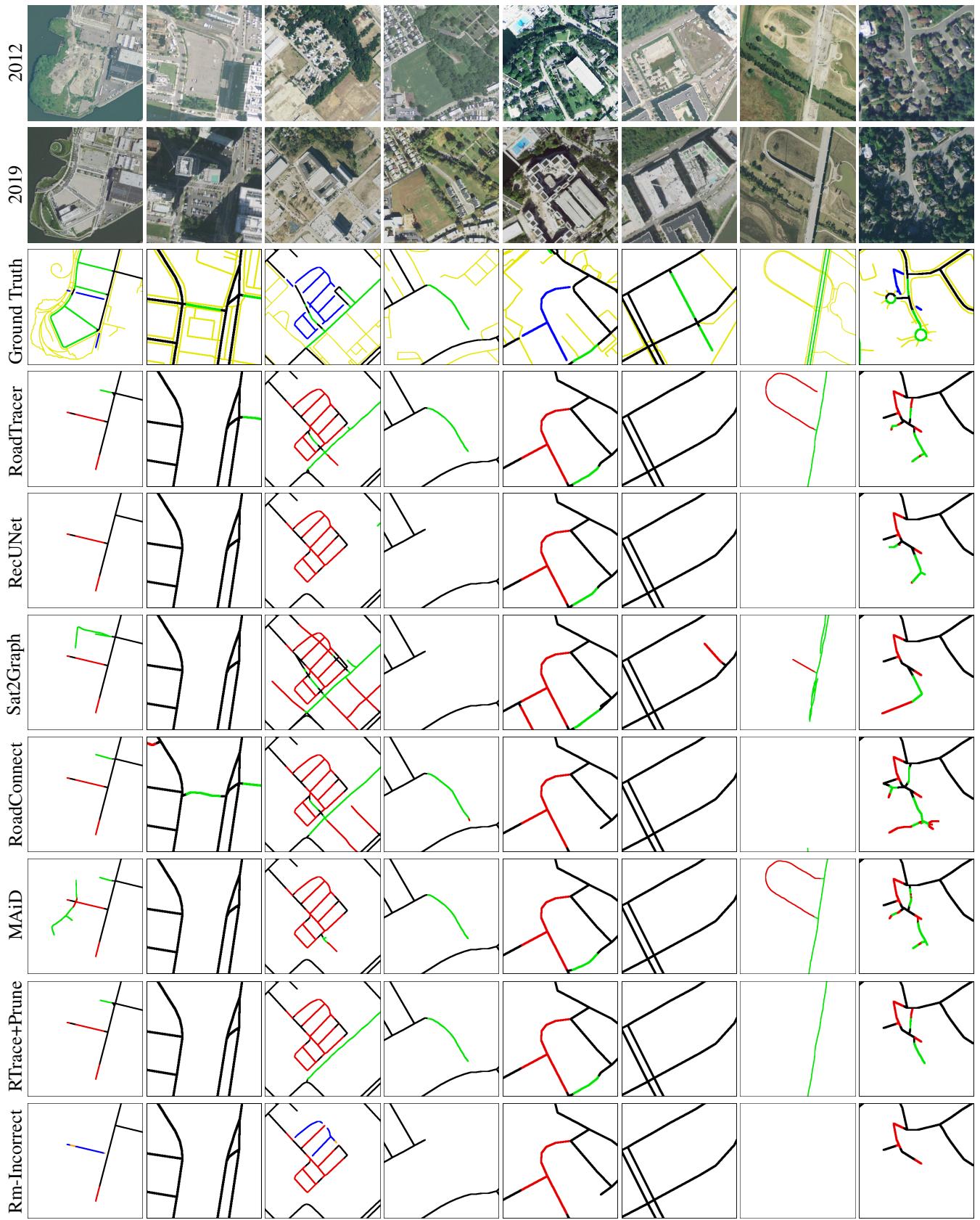
In this section, we include examples of map update scenarios in the MUNO21 test set, along with outputs of map update methods on those scenarios. For visualization purposes, we show a center square region of each map update scenario, which may span a larger rectangular region. We show added roads in green (correct) and red (wrong), and removed roads in blue (correct) and orange (wrong). Segments in the base map G that are left unchanged are black, and segments in G_{extra} are orange. Note that these colors are generated specifically for visualization, and do not directly correspond to how APLS and PixelF1 compare road networks.

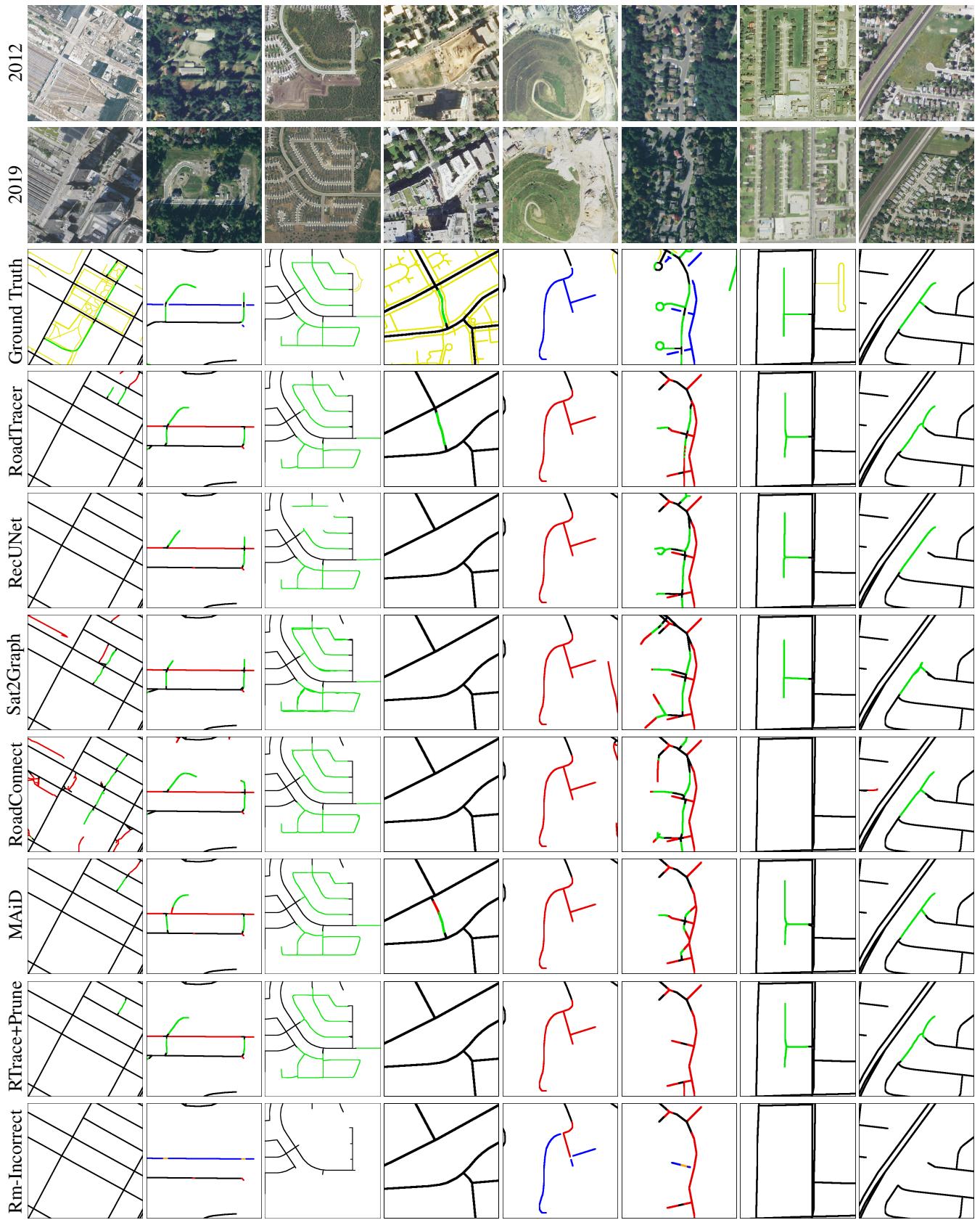
We first show example scenarios with change:

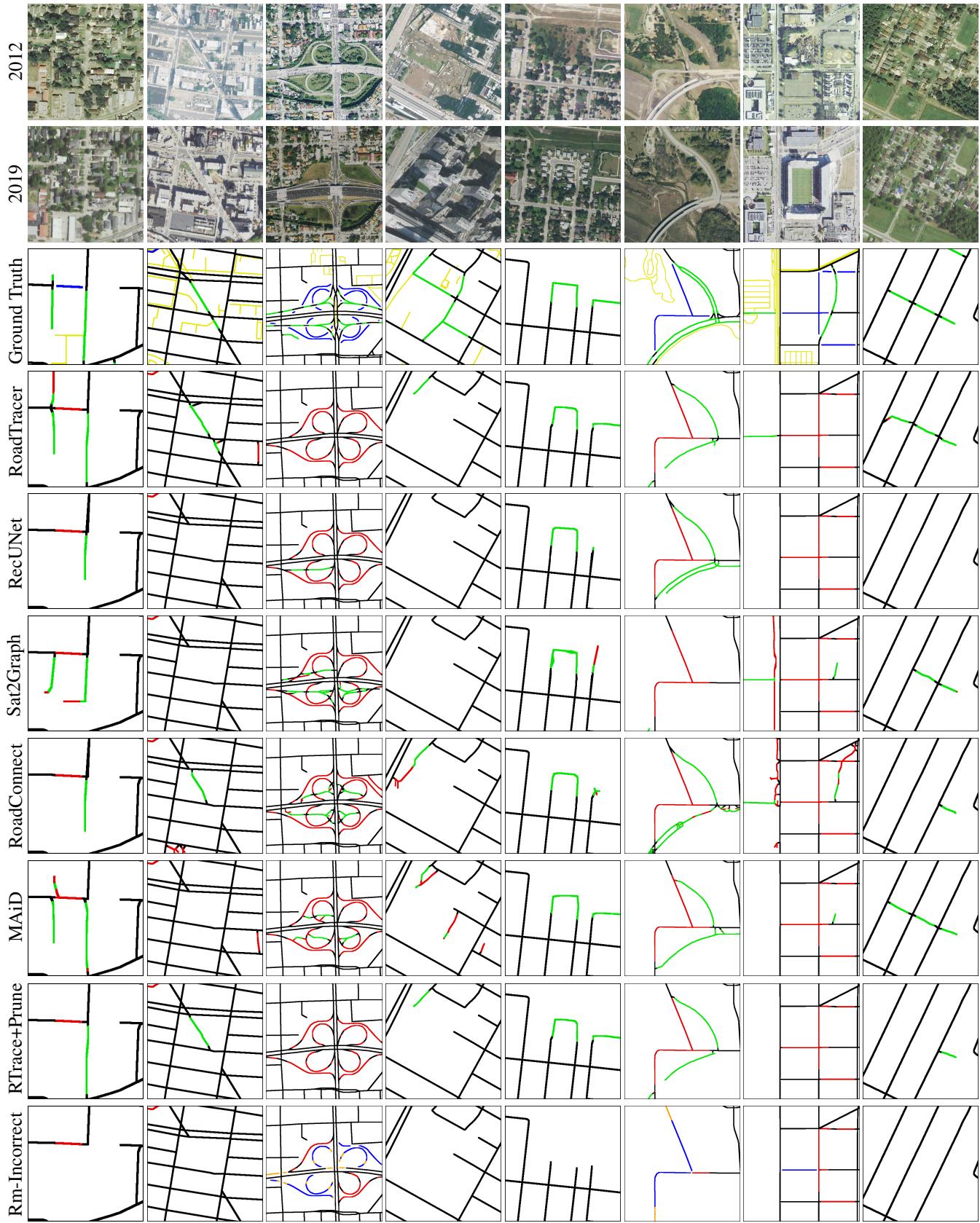












We now show example scenarios with no change:

