Mapping a Small Town

Christopher Beddow
Full Test of Mapping and AI Tools + Open Data

RapiD
mapwith.ai/rapid

QGIS
qgis.org

JOSM
josm.openstreetmap.de

Mapillary
mapillary.com

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Absarokee, MT, USA

Ab-ZOR-kee “children of the crow”

- Small population

Has basic amenities:

- supermarket, gas stations
- restaurants, bars
- churches and schools

- In 2020, lightly mapped:
  - most buildings are missing
  - most businesses are unmapped
  - Mapillary on the main street
Area of Interest

Map with AI & open data!

Sources

- MapWithAI buildings
- MapWithAI roads
- Mapillary map features
- Mapillary traffic signs
- Mapillary imagery
- Satellite imagery
<table>
<thead>
<tr>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add all MapWithAI Buildings</td>
</tr>
<tr>
<td>Capture extra forward facing imagery</td>
</tr>
<tr>
<td>Add all stop signs from Mapillary</td>
</tr>
<tr>
<td>Add all infrastructure from Mapillary</td>
</tr>
<tr>
<td>Add parks and recreation infrastructure from satellite</td>
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<tr>
<td>Add all missing roads from MapWithAI</td>
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<tr>
<td>Add speed limit to all roads from Mapillary</td>
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<tr>
<td>Add all sidewalks from Mapillary + satellite</td>
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<tr>
<td>Add businesses from Mapillary sign detections</td>
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<tr>
<td>Add land use from satellite</td>
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<tr>
<td>Capture complete 360 degree imagery</td>
</tr>
<tr>
<td>Add any other missing Buildings</td>
</tr>
<tr>
<td>Add all crosswalks from Mapillary + satellite</td>
</tr>
<tr>
<td>Add any POIs visible in Mapillary imagery</td>
</tr>
<tr>
<td>Add parking and miscellaneous data</td>
</tr>
</tbody>
</table>
Road Trip
Mapping Vehicle

OSMAnd app (Android)

GoPro Hero6

Garmin VIRB 360
Upload to Mapillary

mapillary.com/desktop-uploader
Mapillary done!

mapillary.com/desktop-uploader
Mapping Buildings

https://mapwith.ai/rapid
Mapping Buildings

Accept, reject, copy

- Accept accurate ones
- Adjust the shape slightly
- Rotate, square off
- Copy/paste missing ones!
- Check closely under trees
- Try all satellite layers
Buildings done!
Land Cover

Parking lots = easy win

- Trace boundary
- Add public/private
- No fees here
- Often customers only
Land Cover

Tennis courts

- Easily spotted
- Map as 1 polygon
- Add public/private
Land Cover

Pool

• Public/private?
• Parking nearby
• Operator? (city)
Land Cover

Farms and football

- Mark operator (high school)
- Name of stadium?
- Trace running track
- Bleachers?
- Add crop type
Land Cover

Natural features

- Forest boundaries
- Tree type?
- Fix river shape
- Cliffs, beach, wetland?
Land Cover done!
Sidewalks & Crosswalks

Mapillary images w/sidewalk

- AI detects sidewalks
- Almost every street!
- Easy to manually trace
Validate and Verify

Use Mapillary + satellite

- Crosswalks visible in satellite
- Mapillary also detects them
- Trace unique lines for footways
- Use satellite as guide
Validate and Verify

Use Mapillary + satellite

- Mapillary can see under trees
- Use satellite to estimate sidewalk distance from road
Utilities

Power / Utility Poles

- Mapillary detects poles
- Can see wire connections
- Shadows sometimes visible on satellite
Utilities (JOSM)
Utilities (JOSM)
Utilities (JOSM)
Traffic Signs

Stop sign

- Detected by Mapillary
- Approx position
- Satellite shows stop lines
- Add directional tag
Points of Interest

Feature Type
- Real Estate Office
  - Name: Absarokee Homes & Land
  - Address: 123 Street
  - Telephone: +1-406-123-4567
  - Website: https://example.com

Feature Type
- Tour Guide Office
  - Name: Absaroke River Adventures
  - Address: 123 Street
  - Telephone: +1-406-234-5678
  - Website: https://example.com

Tags (3)
- Office Guide
- Montana
- Absaroke River Adventures

Additional Features:
- Air Conditioning
- Baby Nosing Area
- Drive-in

COVID-19 Pandemic Hours
- Open; Off same...

Unknown...
Points of Interest

Commercial/retail clusters

• Get object--store--sign from Mapillary API
• 73 items, DBSCAN cluster
• Visible main street clusters
Points of Interest
Mapping done!
Conclusion

One mapper, big impact

• It takes 1 person to map a town
• Same, for neighborhoods
• Mapillary is an excellent tool:
  - Capture images on the go
  - Review the images on the computer
• MapWithAI:
  - Use satellite, street-level detections
  - Always add detail and fixes too
Next steps

The future of craft mapping

• Drones + OpenAerialMap
• MapWithAI Tasking Manager
• Mapillary Missions
• StreetComplete, Every Door
• Use all tools that can enhance one mapper’s impact