Routing (and Route Planning)

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State Of The Map Conference
Manchester, 15 July 2007
Agenda

- What is Routing, Route Planning?
- Algorithms
- Data
- Existing Applications
- Future Development
<table>
<thead>
<tr>
<th><strong>Routing</strong></th>
<th><strong>Route Planning</strong></th>
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<tbody>
<tr>
<td>• user needs instant response</td>
<td>• user has time to wait</td>
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<td>• non-interactive, “just work”</td>
<td>• interactive, “tune and tweak”</td>
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<tr>
<td>• start from any GPS position</td>
<td>• start from well-defined address</td>
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<td>• any result as long as you get there</td>
<td>• effort to find best result</td>
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Algorithms: Dijkstra

Start

Dest
Algorithms: Dijkstra
Algorithms: Dijkstra
Algorithms: Dijkstra
Algorithms: A*
Algorithms: A*
Algorithms: A*
Algorithms: A*
Algorithms: A*
Algorithms: A*
Algorithms: A*
Algorithms: A*
Data: Travel Restrictions

- time ("road closed 22-8h")
- vehicle type ("no HGVs")
- no through traffic
- travel direction (oneway)
- turn restrictions
Data: Speed

- road type (motorway, trunk, primary, secondary, unclassified)
- speed limit (maxspeed)
- expected delays, average speeds – possibly forecast for date of travel!
Data: Signposting

- “follow A82 towards Crianlarich”
- house numbers
- road layout

On the map: “turn left onto…”

But, on the ground: “continue on…”
Data: Problems

- level crossings (intersecting ways) – forgotten bridge/tunnel or intersection?
- data model has no relationships, required for turn restrictions, signposting
- level of detail (walkway along the road or separate footpath, etc.)
gosmore

- C++ application by Nic Roets
- planet browser, name finder, router
- 1,200 lines of C++ code
- small memory footprint (256 MB for full planet file)
- Linux only
1. Take the exit onto A5 toward Frankfurt
   35.5 km, 18 mins
2. Take exit 40-Kreuz Walldorf to merge onto A6 toward Heilbronn
   205 km, 1 hour 45 mins
3. Take exit 60-Kreuz Nürnberg-Ost toward Berlin/Dresden/Bamberg/N.
   1.1 km
4. Merge onto A9
   380 km, 3 hours 17 mins
5. Continue on A10
   9.9 km, 5 mins
6. Take exit 16-Dreieck Nuthetal to merge onto A115 toward Berlin-
   Zentrum/Berlin-Zehlendorf/Potsdam-
   Zentrum
   29.4 km, 18 mins
7. Merge onto A100
   8.3 km, 4 mins
8. Take exit 20-Tempelhofer Damm for B96, 0.3km
9. Turn left at B96/Tempelhofer Damm
   ...
Future – Opportunities

- Specialist Routing (Bikes, Pedestrians - Waterways?)
- Current Data
- Routing with “User Feedback”
Future – Caveats

- Result-Oriented Vandalism
Future – Caveats

- Errors and Omissions

Sat nav driver's car hit by train

A 20-year-old student's car was wrecked by a train after she followed her sat nav system onto a railway track.

Paula Ceely, was driving her Renault Clio from Redditch, Worcestershire, to see her boyfriend at his parents' home in Carmarthenshire for the first time.

She was trying to cross the line in the dark when she heard a train horn, realised she was...
Conclusion

- routing not #1 priority for contributors at the moment
- large potential to be better than existing commercial offers
- data incomplete, data model insufficient
- but works surprisingly well already!
Thank You

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