Multimodal journey planning with PEPTRAN: Pedestrian and Transport Navigation

Rory Doyle

British Maritime Technology, Middlesex - UK
Multi-modal journey planning with PEPTRAN: Pedestrian and Transport Navigation

Rory Doyle - BMT
PEPTRAN Project Summary

• PEPTRAN has developed software to guide end users from point to point within a city or district in most efficient manner using a combination of both pedestrian and public transport modes.

• System to be implemented on hand-held and car-based devices

• Hand-held and car-based systems co-operate to deliver Park & Ride routing.
Route-Planning with Hand-held

Pedestrian is guided to nearest public transport access point

User follows public transport route, including further pedestrian routing between access points

User arrives at destination
User is guided by the in-car navigator to a suitable Park & Ride point. The subsequent public transport route is transferred to the user’s handheld device.
What do public transport users want?

• “What is the best route from A to B - setting off now?”
• “What about for tomorrow morning?”
• “I know the route, but is the train on time this morning?”
• “I hate using buses - I never know when to get off”
• “I’m lost! How do I get back to the hotel?”
The visitor

• Wants full point-to-point information
• Doesn’t know where bus routes etc. go

• Generally uses car, taxi, trains/underground, but not bus/tram

• Probably less concerned about speed, but reliability may be important
The commuter

• Doesn’t want route information, and may know walking times better than our software

• Does want to know if transport is running on time - when do I leave home? Do I need to take the car?

• Will run the same query every day - a preset route would be useful.
The park-and-ride commuter

- Like the commuter, but wants to know if there’s a delay on one line, so he can set off early or park somewhere else.

- May be interested in transferring routes from the car to the hand-held.
Basic User Requirements

• **Timetabling**
  - For advance planning

• **Route Planning**
  - Including storing favourite routes

• **Stored-route Checking**
  - Checking regular commuting routes
  - Checking pre-planned routes
Overview of PEPTRAN system

- PNS
- CNS
- PTNS
- Live Data
- Static Data

Data formats:
- HTML
- XML
- MySQL
- Oracle & SQL Server
Hand-held Operability
Handheld Delivery
In car

PEPTRAN test car with in-car GPS navigator developed by CRF
Web-based Operability

PEPTRAN is able to plan the best possible journey between two points, using a combination of driving, walking and public transport services. Click here for more information.
Web-based Operability

Enter your journey date/time and start and end coordinates (if known) or street names to search for.

Search Locations

Start place
- please select -
- please select -
C.FRANCA / CEINAUDI RIVOLI
C.FRANCA / C.TORINO RIVOLI
C.FRANCA / P.RIVOLI
C.FRANCA / P.RIVOLI
C.FRANCA / VASSISI RIVOLI
C.FRANCA / V.BRUERE RIVOLI
C.FRANCA / V.F.LLI MACARIO RIVOLI
C.FRANCA / V.PAVIA RIVOLI
C.FRANCA / V.SCALENGHE RIVOLI
C.FRANCA DOPO P.RIVOLI

End place
C.FRANCA / V.BRUERE RIVOLI
C.FRANCA / V.F.LLI MACARIO RIVOLI
C.FRANCA / V.PAVIA RIVOLI
C.FRANCA / V.SCALENGHE RIVOLI
C.FRANCA DOPO P.RIVOLI

Start coordinates
End coordinates

Search Time
- Leaving at
9:33

Arriving by
19

Back
Send
# Web-based Operability

## Solutions

<table>
<thead>
<tr>
<th>Route</th>
<th>From</th>
<th>Arrives</th>
<th>Journey Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 C.FRANCIA / P.RIVOLI</td>
<td>C.VITTORIO EM.II - PORTA NUOVA F.S.</td>
<td>11:13</td>
<td>24 mins</td>
</tr>
<tr>
<td>2 C.FRANCIA / P.RIVOLI</td>
<td>C.VITTORIO EM.II - PORTA NUOVA F.S.</td>
<td>11:07</td>
<td>24 mins</td>
</tr>
<tr>
<td>3 C.FRANCIA / P.RIVOLI</td>
<td>C.VITTORIO EM.II FRONTE PORTA NUOVA F.S.</td>
<td>11:16</td>
<td>33 mins</td>
</tr>
</tbody>
</table>
User Trials

- **Torino – Italy**
  - 5T Consortium - Complex traffic and transport management system.
    - Manages the urban and suburban public transport services of Torino and the 25 surrounding municipalities.

- **Hampshire – UK**
  - Provide essential services for 1.2 million people across Hampshire – 3 cities, Southampton, Portsmouth and Winchester
  - At forefront of advanced telematics and ITS
    - Fully operational traffic and travel information centre.
    - Provides a model test site for intelligent transport systems.
Which of the following statements best describes the usefulness of the information provided on the communicator?

- Helps avoid potential travel problems
- Opens up new solutions
- Can help organise my trip planning in the best possible way
- Optimises use of public transport
- Viable time-saving aid

HCC Turin
Usefulness of PEPTRAN

- The main usefulness of the information provided was for optimising the use of public transport and for finding new solutions to routes travelled.
Regarding the level of detail of the information provided on the communicator, which of these definitions do you think is most appropriate?
• There is a vast difference in the feeling that the data was complete or not between the sites.
• This is due to the data origin being very different at each location.
  – In Turin a live real-time database is queried, thus all possible routes are available for every query,
  – whereas in Winchester it was mainly static data that was used, and whilst every effort was made in the production of this data it still did not include every possible route on the network.
After using the route planner on the communicator, do you think you might use public transport more often?

- **not likely**: 21% (HCC), 21% (Turin)
- **perhaps**: 31% (HCC), 42% (Turin)
- **most probably**: 9% (HCC), 29% (Turin)
- **definitely**: 2% (HCC), 3% (Turin)
Outlook for Public Transport

• All of the users involved have had the opportunity to trial PT and some may use it more often now.
• The 2 and 3% definitely is very encouraging as it is annual growth of this order of magnitude which Hampshire in particular are aiming to achieve.
• These results also show that information provision is only part of the solution to encouraging more passengers onto PT. Other studies external to PEPTRAN have shown that it needs to be combined with other initiatives such as newer and cleaner bus fleets and improved services and routes.
• a multi-modal route planner that allows for disability specific routing information and reservation of accessibility services

• geographically indexed accessibility information

• disabled friendly mobile user interfaces
MAPPED Interface
Localisation

(a) PDA jacket
(b) Combined sensor requiring cable connection
(c) Bluetooth enabled sensor
MAPPED Issues

- Wheelchair access to services
- Assistance
- Announcements of which stops have been reached for visually impaired
- Steps
- Steep gradients
- Workmen are digging up the pavement at a certain point on the street which makes it impassable for a wheelchair
- Reserving
Policy

- **Real-time information**
  - Test site satisfaction
- **Delays**
  - good thing
- **Informed**
  - less waiting
  - increased satisfaction
- **Real-time information more important than timetable information**
Policy

- **Image**
  - Dirty
  - Overcrowded
  - Unreliable
  - Inconvenient

- **Parking**
  - Security
  - Reservations

- **Convenience**
Policy

• Standards for electronic Public Transport Information
  – Some exist
  – Currently poor uptake
  – Commercial reality
    • heterogonous
Conclusions

• PEPTRAN has been successfully trialled in Hampshire and Torino.
• MAPPED will extend PEPTRAN to cater for the accessibility needs of disabled users.
• Our Life would have been easier if
  – electronic standards for Public Transport information were available
  – public perception of public transport was improved
  – real-time information on public transport was available