

Maps and Apps

Transport Focus

Research to understand
how drivers best recall
journeys made on the SRN



- Background and objectives
- Methodology
- Research Findings
- Conclusions and recommendations
- Appendix

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Background and objectives



Background

Transport Focus wish to understand how accurately users recall their journeys on the Strategic Road Network (SRN) – the motorways and major ‘A’ roads managed by Highways England.

In particular, Transport Focus are interested in the validity of responses that would be given in an online environment and using interactive mapping solutions.

Transport Focus commissioned this research in order to better understand factors which affect how drivers most effectively recall journeys made on the Strategic Road Network (SRN).



Objectives

1. To explore how SRN users are able to accurately represent their most recent SRN journey using three map formats (paper / online static / online interactive)
2. To examine the factors that are likely to affect accuracy and how these might be overcome in future online research
3. To identify the elements of journey recall that make it difficult for users to accurately represent their journey
4. To recommend the most effective mapping tool for use in future research
5. To identify any barriers to using a tracking app
6. To inform subsequent research and formulate potential scenarios/options that might be evaluated



Methodology



Methodology

A qualitative approach was designed, with pre-task and clinic sessions.

Recruit SRN users

- Respondents recruited who are planning 2+ journeys on the SRN in the near future

Download & install app

- Respondents prompted to download and install the TrackMyDrive app

Make pre-task journeys

- Respondents employ app to record several journeys during the pre-task period

Clinic sessions

- Moderators ask respondents to spontaneously recall their journeys
- Moderators then ask respondents to identify their journey via paper map / online static map / online interactive map (order rotated)



Sample

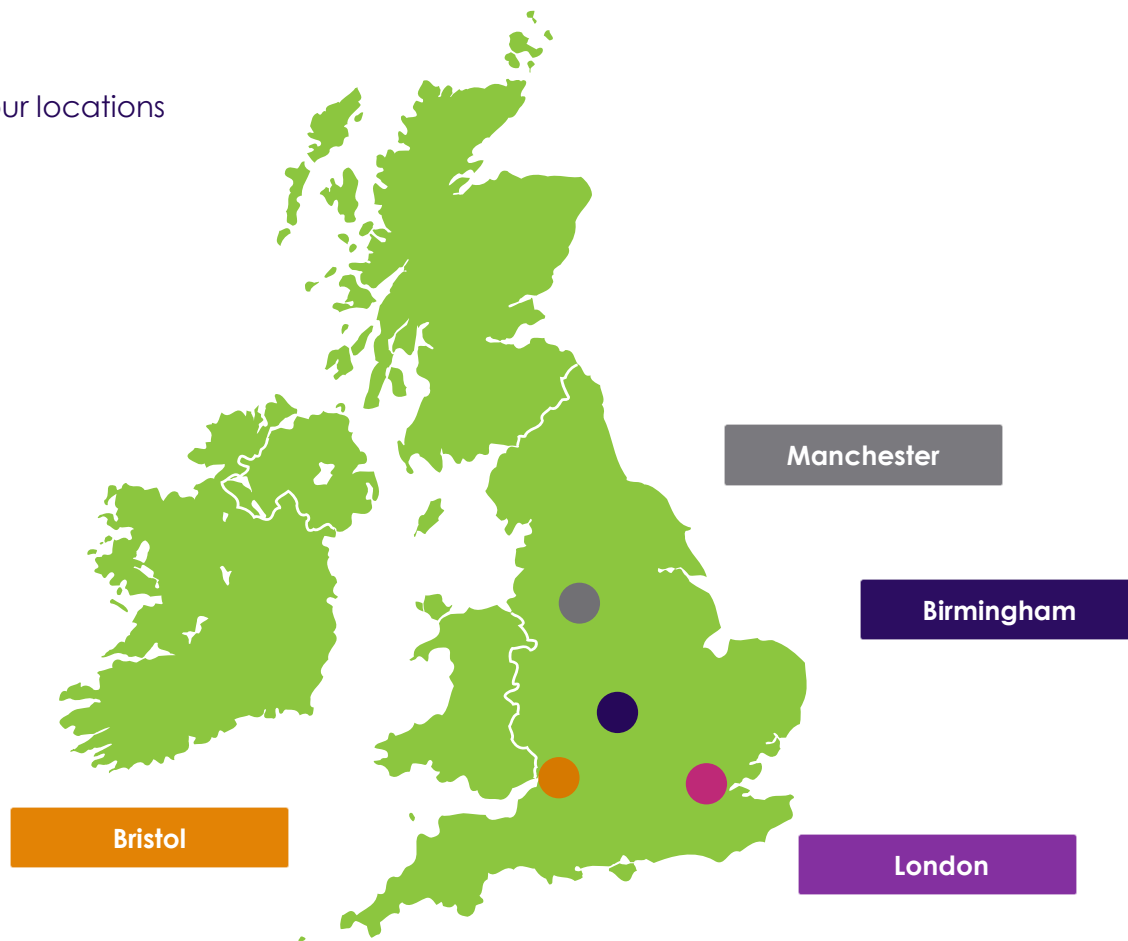
Who we spoke to:

- 22 x respondents in total
- Mixed gender across the sample
- Broad age range, including 2 x 70+ years
- Even mix of frequent, medium and infrequent SRN usage
- At least eight depths familiar with journeys made, and at least 8 unfamiliar
- A spread of online mapping usage
- Half with older (1 year +) phone and half with newer phones
- Even spread of app usage from heavy to non-user across the sample



Sample

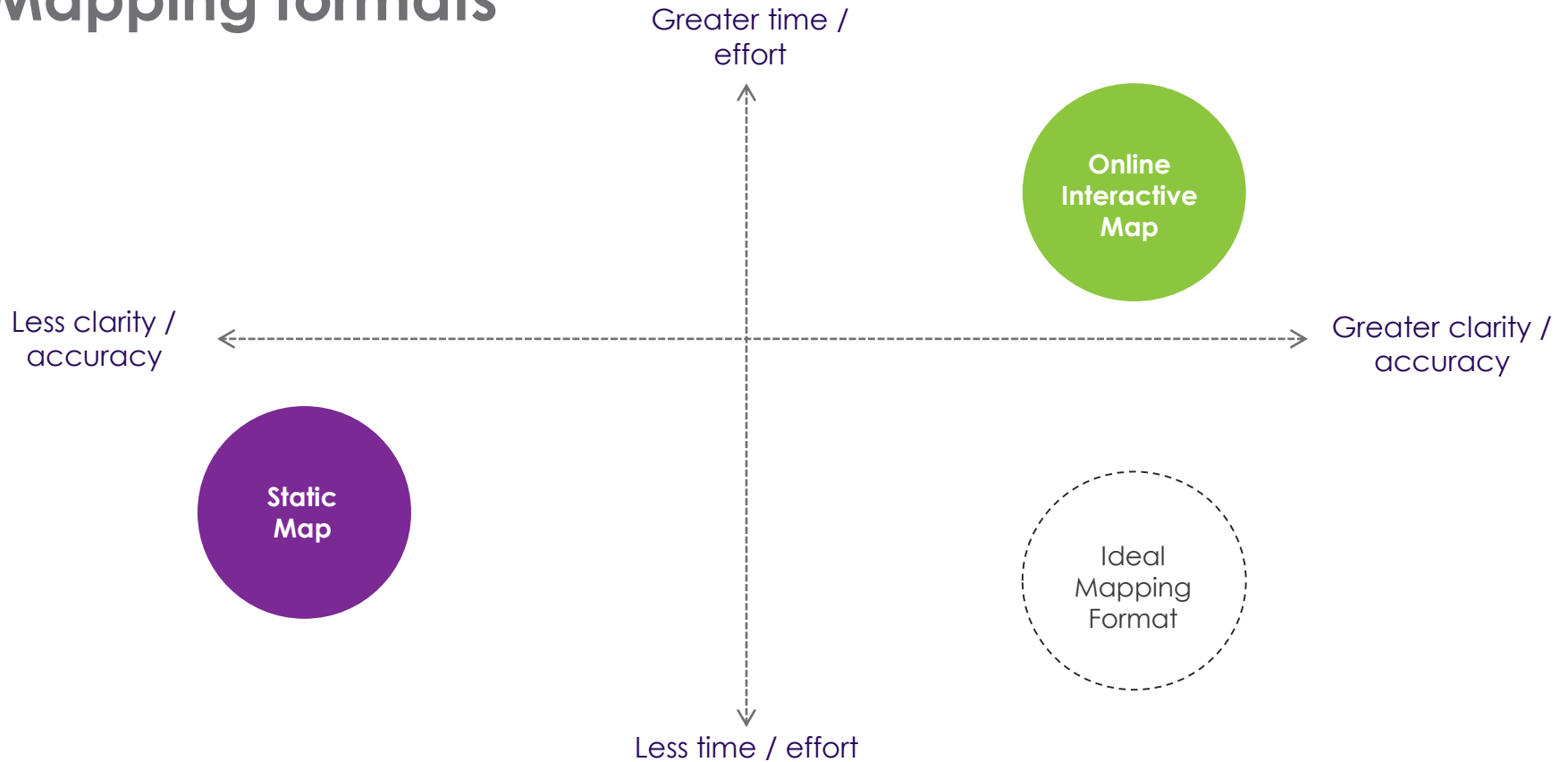
22 x 45 minute depths across four locations



The background of the slide is a solid orange color. On the right side, there is a large, abstract geometric pattern composed of several overlapping hexagons. Some hexagons are white, while others are orange, creating a complex, crystalline structure that extends from the top right towards the center of the slide.

Research findings

Mapping formats



Online interactive mapping proved more effective at clarifying details of journey recall overall



Context

Driving and navigation

- Majority of respondents (all ages) use interactive, online mapping applications in advance of a 'new' journey (Google Maps is most frequently cited)
- Online maps are used to plan their route – and some (older) print off their journey route as back-up
- Some older respondents (60s/70s) also keep a printed road atlas in their car
- Majority of respondents also use in-car satellite navigation system to aid their journeys (again, for new journey or amended journey)



My dad is about 55, he uses Google Maps, since I showed him how to use it. He uses that instead of maps now, and now he has apps on his phone

[Male, 23, Midlands]



Drivers are accustomed to planning unfamiliar journeys with online interactive mapping applications



Context

Driving and navigation



- Most journeys are familiar / repeated – i.e. commuting, visiting family/friends, leisure, shopping etc.
- Typically there are three or four alternative routes drivers can opt for, should their familiar journey require a change of route. E.g. encountering heavy traffic, roadworks, lack of time, on a whim, etc.
- Most sections of journeys involve part of the SRN – as well as minor roads (A and B) either in countryside or large cities

Most journeys are familiar and repeated – but many drivers also have other options if they face road diversions or other pressures

Recalling a journey

Respondents were prompted to recall journeys

- The majority of journeys were 5-20 miles in length, and were mostly work commutes or social / leisure
- Respondents typically started their journeys on familiar, minor roads, which eventually progressed towards an A road or motorway
- Whilst most respondents claimed to have accurately recalled a journey, approximately a third made minor errors of recall related to the SRN
- Most errors of recall are on A roads - typically a particular section of road was forgotten, misnamed, or in some cases participants genuinely did not believe they had driven on that road
- Roadworks, accidents and diversions tend to prompt some spontaneous re-planning, and can result in enhanced recall of journey detail



The majority of recall inaccuracies were on A roads

Recalling a journey

Use of navigational markers

- Visible landmarks on journeys form key navigation markers for respondents when recalling journeys
- Respondents across age and gender refer to distinct landmarks, some of which represent personal interests:
 - E.g. football grounds, pubs (distinct names), shopping centres, roundabouts with distinct names, topographical features, bridges
- Respondents also referred to motorway junctions and roundabouts as navigational markers
- Navigational markers are deeply embedded in participants' subconscious and used in the same way when giving someone else directions to a particular location



Navigational markers play a key role in assisting with journey recall

Recalling a journey

Use of navigational markers

- Evidence of respondents seeking out landmarks when driving in order to actively remember landmarks for return journeys
- Some evidence also of drivers seeking out landmarks on Google Maps – by zooming into street level to help provide navigation prompts (e.g. distinct buildings, etc.) when planning a journey

“

...then when I go to my sisters, I tend to pick out points where I know I need to make a turning...like the big Argos, as I made a mistake once at night, and I never want to do that again
Male, 63]

”

“

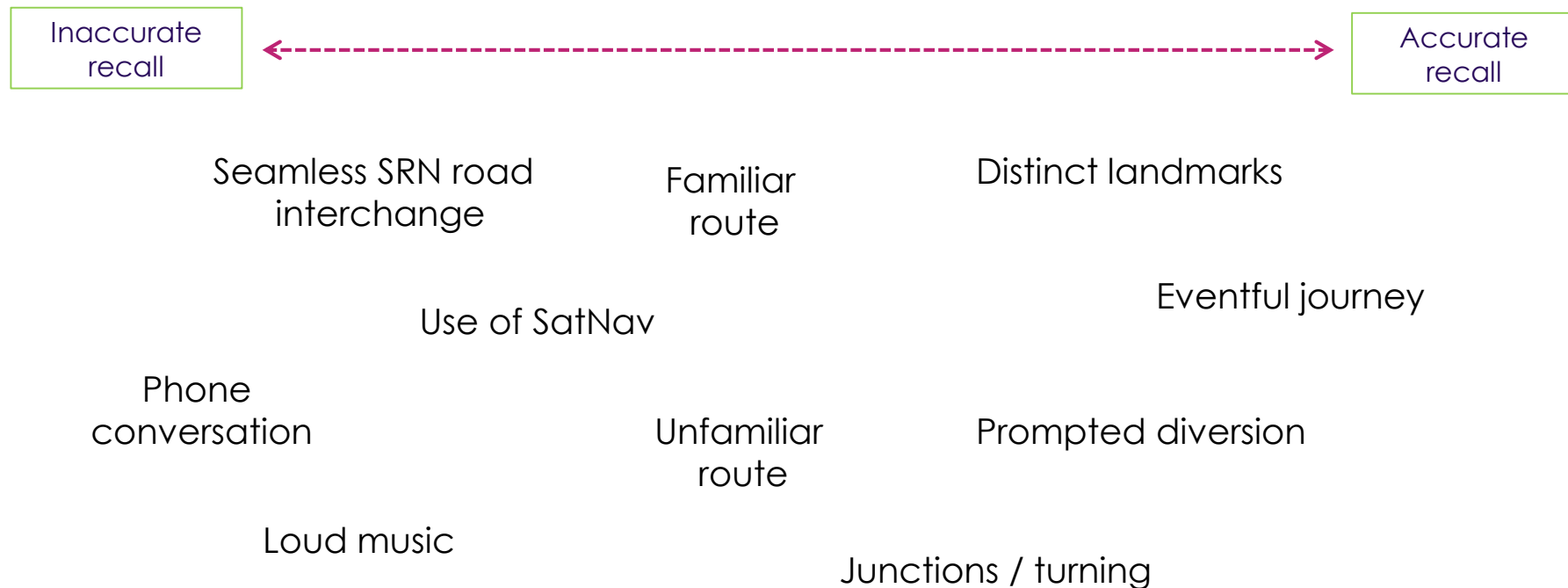
When I plan with Google Maps I zoom in so far so that I can see, say, a bank...then I know much more about where I am
[Male, 32]

”

Some drivers actively seek out distinct landmarks to aid future navigation

Recalling a journey

A wide range of factors can impact on recall accuracy



Understanding of SRN

Low awareness of SRN categories

- The majority of respondents had little awareness of which roads were part of the SRN prior to looking at the maps
- Though many are aware that motorways and some larger A roads are in some way different from 'local roads', very few have a clear knowledge
- Some respondents (older, male) are aware of grouping of motorways and 'trunk roads', and know they belong to a different status than other smaller roads



Understanding of SRN is limited - reflecting a wide range of formal and informal terminology for roads



Understanding of SRN

A roads create most confusion for accurate recall

- Respondents often used local names for 'A' roads
- In other cases, respondents referred vaguely to an 'A' road, without knowing (or using) the formal or informal name
- Overall, though, the greatest confusion is around which sections of their journeys on A roads are actually of SRN status
- For example, the A13 in Essex is not always part of the SRN (as well as having a variety of informal and/or local names for several sections)
- Some sections of A roads also cause naming confusion around status – e.g. A1 turns into A1(M), and back into A1 again

The names of many A roads are particularly confusing

Understanding of SRN

Less confusion with motorway recall and awareness than A roads

- Respondents are significantly more aware of, and are better able to recall, journeys made on motorways than on A roads
- In a minority of cases some respondents had forgotten (or were unaware) they had driven along short sections of motorway
- This was typically the case where a number of motorways connected in an area (e.g. Around London, Birmingham)



Awareness and recall of motorways is generally good

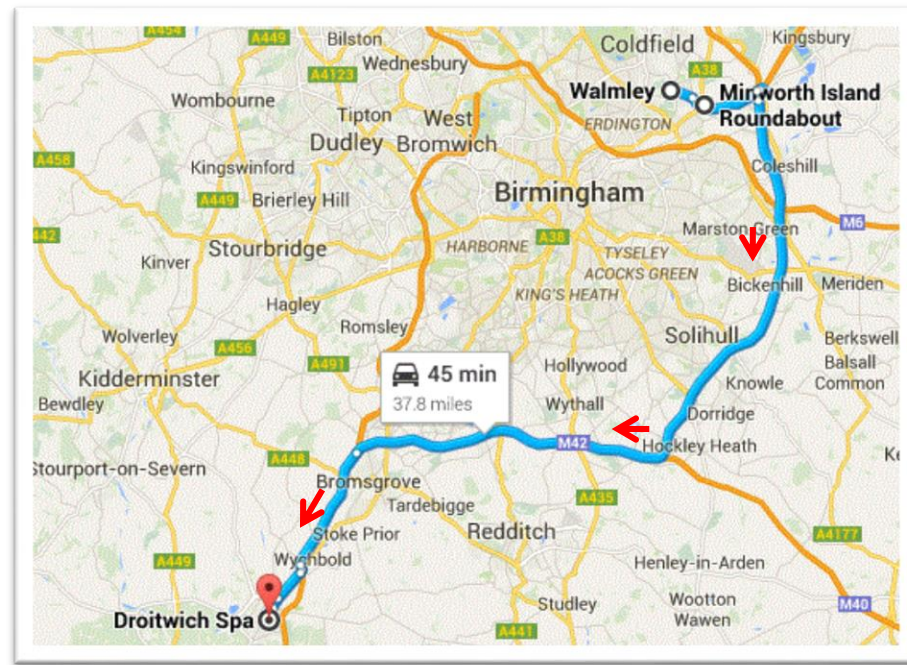
Case Study 1: Jean (55)

Spontaneous recall

“ I left home, down some small roads, which is nice, and went down the Kingsbury road...actually, it might be the A38. It's a dual-carriageway, it's fast flowing. I am building up to what is known as Dunton Island - which is a mammoth island with four lanes, and you have to weave round to the right one. I think it has about six exits. It's great if you know where you are going! So... I took the '42 (M42)... and I was on that for about two junctions I think. Going southbound. I came off at the junction that tells me I have to come off...and so I have been on that motorway for about 10-12 minutes. There might have been a dual-carriageway somewhere...and then I came off, and then it was minor roads all the way to Droitwich. ”



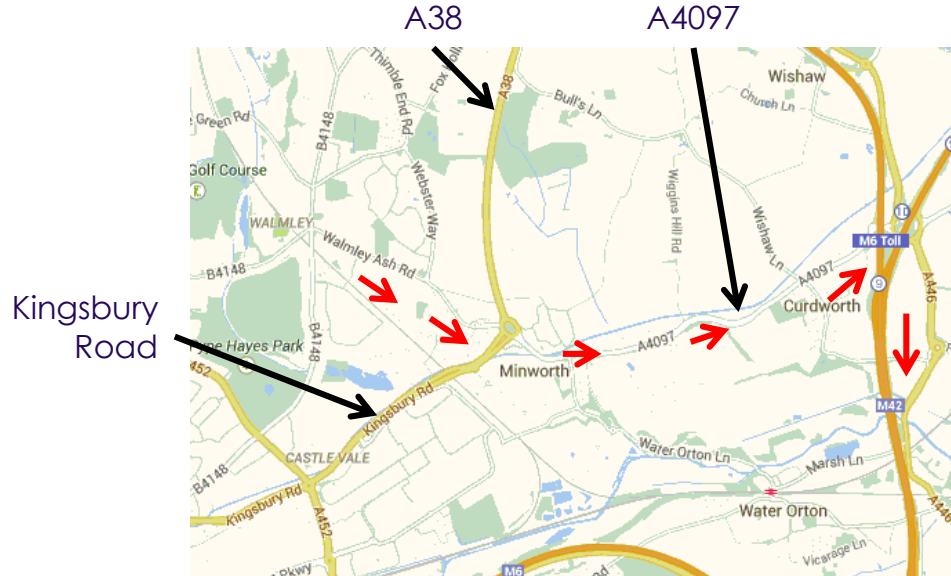
- Start: Walmley
- Destination: Droitwich
- Type: Social / shopping
- Familiarity: Good



Case Study 1: Jean (55)

What actually happened

- Jean did not drive down the A38.
- Jean actually drove eastwards on the A4097 – which is not a continuation of the A38 / Kingsbury Road (i.e. either a mistake, or a local naming quirk).

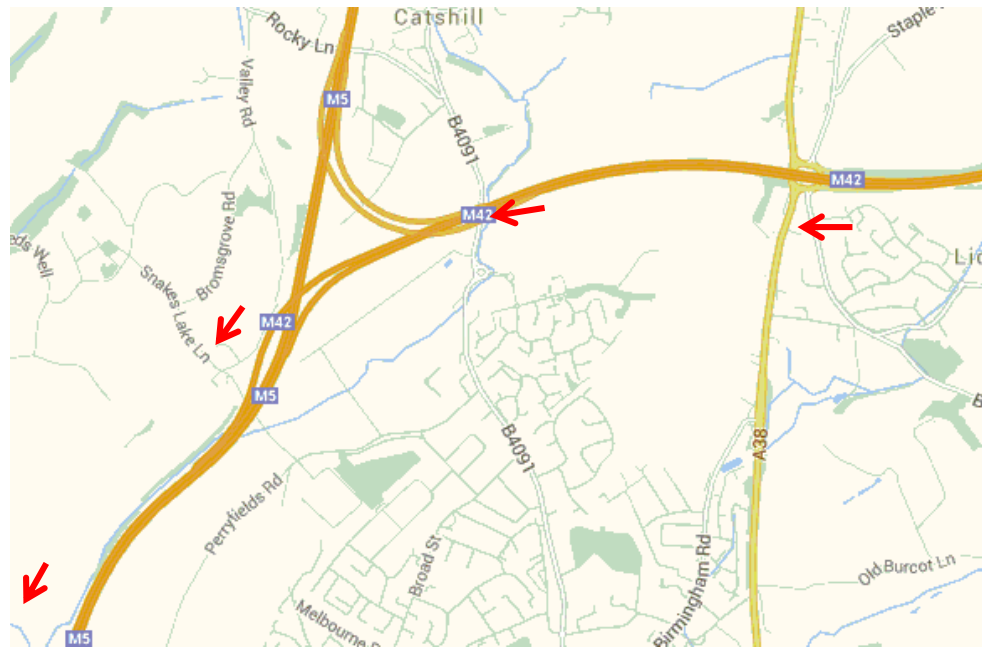


A road confusion – compounded by local names

Case Study 1: Jean (55)

What actually happened

- Jean actually drove on the M5.
- Jean merged from the M42 onto the M5 towards the latter part of her journey.
- Partly this was forgotten, but also partly a result of a seamless merger from M42 onto M5 (i.e. a junction may have prompted better recall).

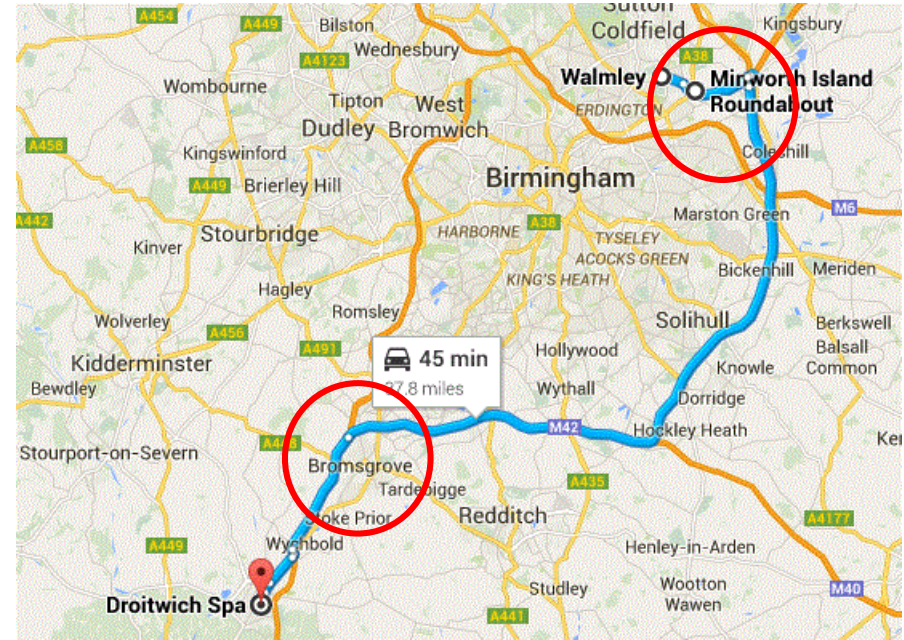


Seamless motorway mergers can weaken recall

Case Study 1: Jean (55)

Summary

- Both of these inaccuracies were identified and corrected when Jean used the online interactive map.
- Whilst the paper map prompted some uncertainty, the small scale prevented adequate identification.



Online interactive map proved effective in identifying motorway and A road recall errors



Case Study 2: Graham (32)

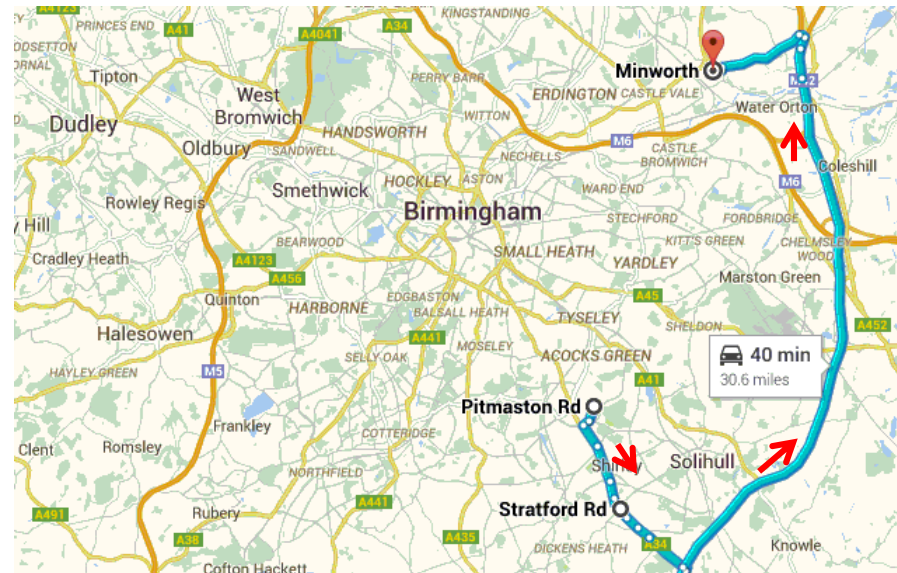
Spontaneous recall



Start: Hall Green
Destination: Minworth

Type: Work journey
Familiarity: Good

“ I started at Pitsmaston Road, I think it's called, or something like that, which is a local road. Then I took three or so more local roads, up to the main A road, which is a dual carriageway. That then takes you to Shirley area, it's one road, a few islands, then you come to the big island...junction 4 of the M42 I think it is, then M42 all the way - I was planning on M42 then M6 at junction 7 or 8, because that's close to our office, but there was an accident on the traffic report, so I just re-planned it in my head and turned off at junction 9 (M42) and back up, which then leads to the A-something else, I can't remember, and then eventually onto the Kingsbury road and to my office. ”



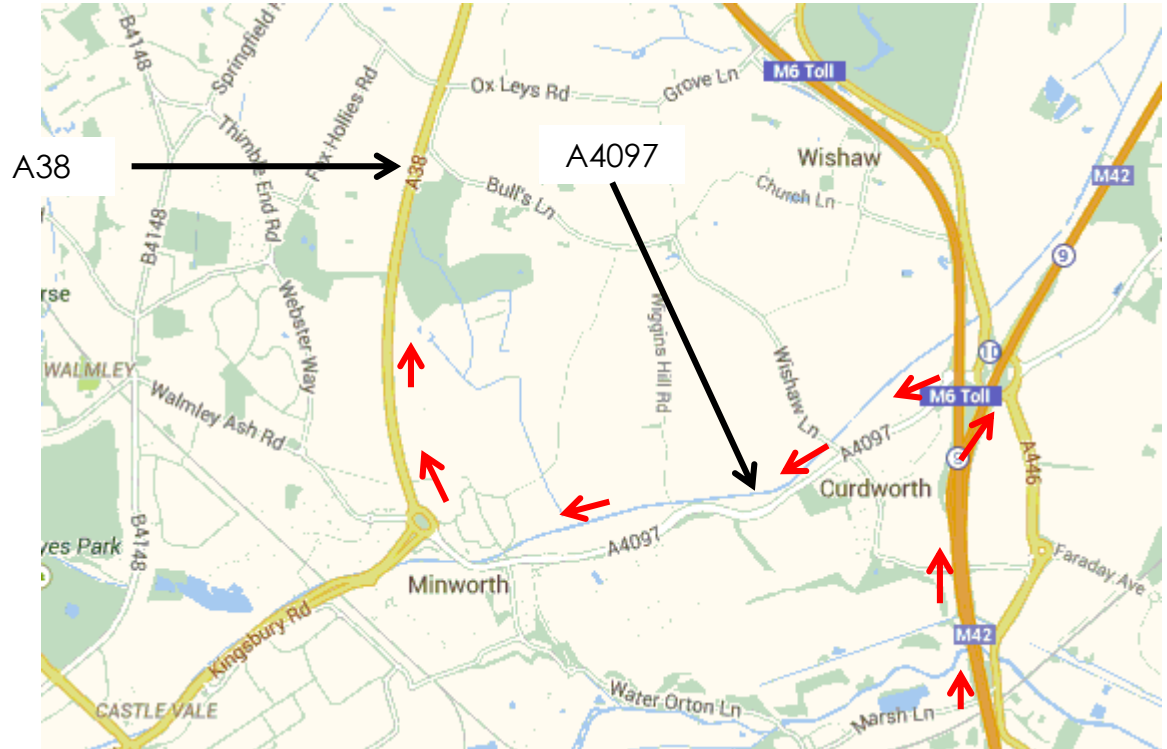
Graham took a significant detour to avoid congestion in the city centre



Case Study 2: Graham (32)

What actually happened

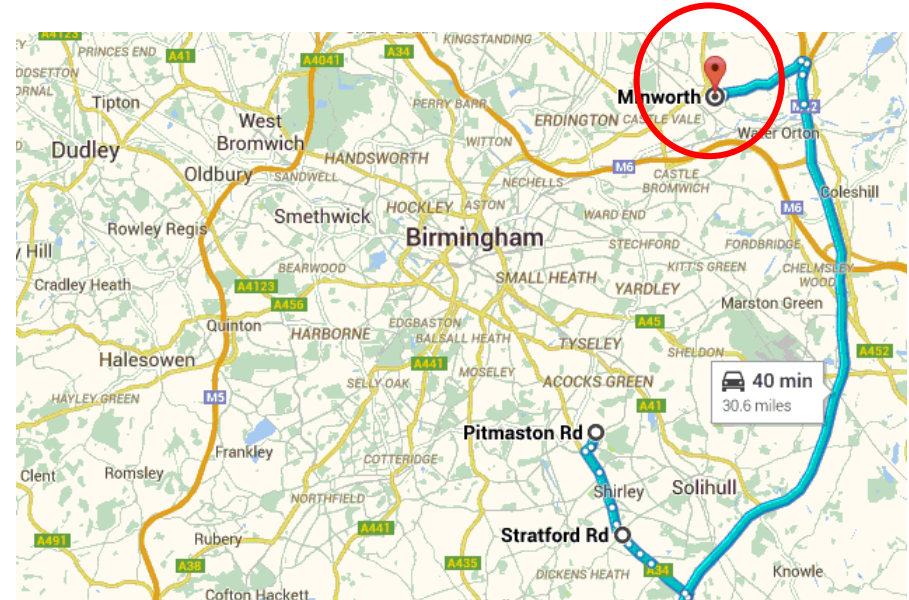
- Graham did recall the SRN section of his journey correctly
- Towards the end of his journey, he did travel on two A roads (A38 – which he called 'Kingsbury Road'; A4097 – which he did not know the name for



Case Study 2: Graham (32)

Summary

- Graham largely recalled his journey correctly.
- However, the online interactive map helped him identify with greater clarity which roads he moved onto once he came off the M42.



Online interactive map helped clarify elements of journey

Case Study 3: Lucy (27)

Spontaneous recall

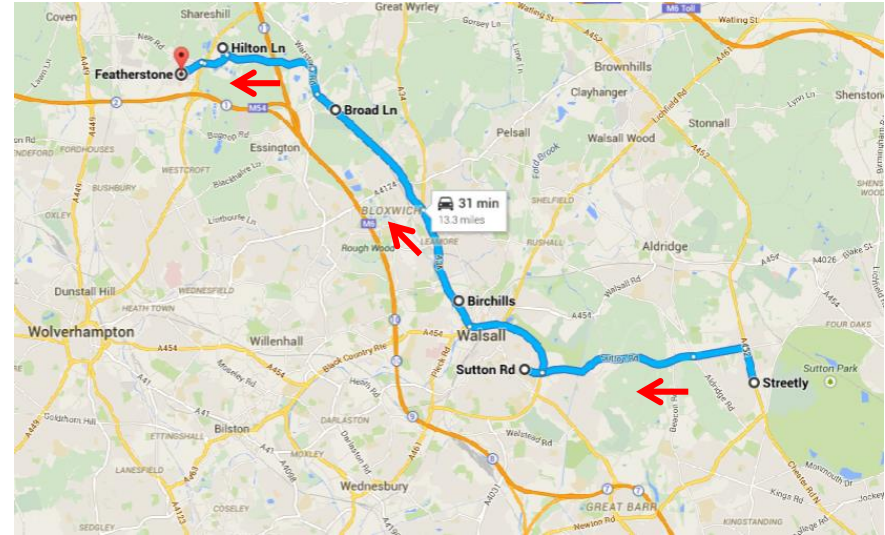


I put my music on first, then set off. I went down the Aldred road, I think it's a B road, and then onto Sutton Road, which heads towards Walsall town centre, and then past junction 10 of the M6 I think...that direction...I am not sure of the road names, as it's not a journey I am familiar with. And then it was A roads I think toward Wolverhampton. Then it becomes a bit countryside-ish...so I went down Hilton Lane, I remember that, and then I was in Essington, which is a bit more residential. I try to avoid the motorways at these times - especially the M6.



Start: Streetly
Destination: Featherstone

Type: Social
Familiarity: Low

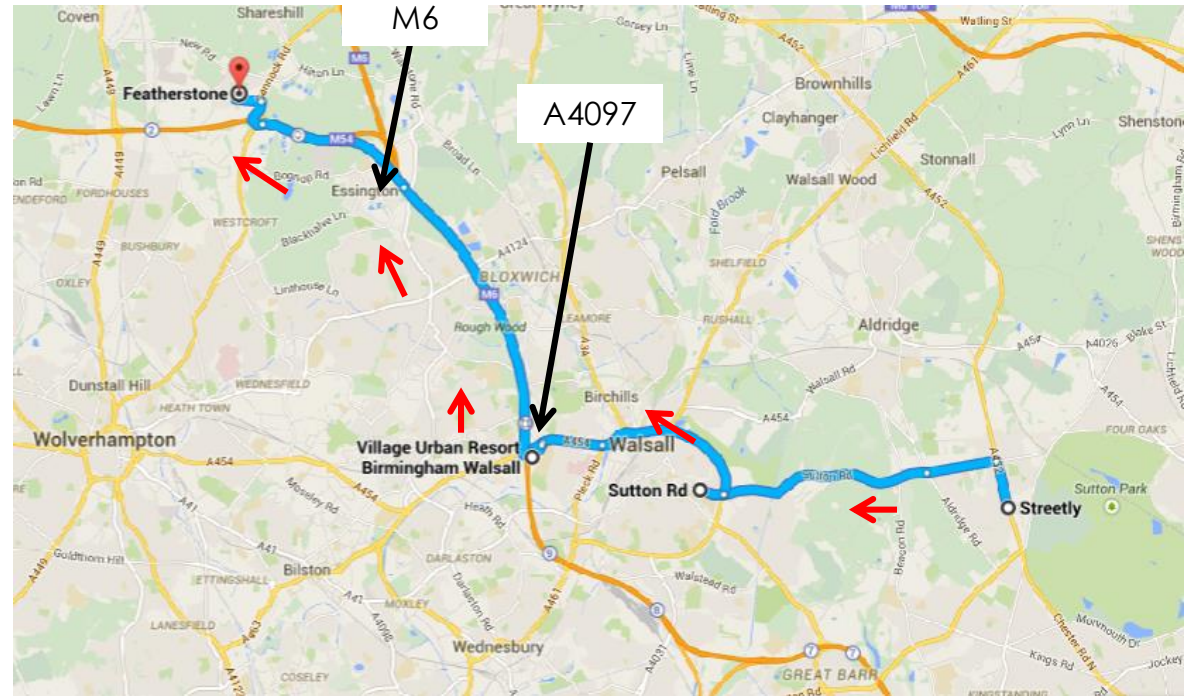


Lucy is certain she drove on minor roads to visit her friend in Featherstone

Case Study 3: Lucy (27)

What actually happened

- Lucy actually travelled on the M6.
- This was not recalled by either the static maps or the online interactive map – but (finally) by the app data.
- This error was blamed on distraction during driving (talking to friend on phone), and use of SatNav which weakened concentration of actual route taken.



Case Study 3: Lucy (27)

Static Maps



Online interactive map



App data

“ Quite possibly I would have gone by this island here (where M5 meets M6), or was it this one here? I guess this is junction 10? I think that was junction 11...so I may have gone over one of these roads here...but I don't think I went on the motorway, possibly, but I am not entirely sure which one. I think I went across...I think this blue one is the motorway? I may have cut across the motorway there. Whatever the SatNav said...”

?

“ I think I might have gone around Walsall...quite possibly that road, and then cut across, through Hilton Lane...I remember going down that lane, as it was closed off halfway done for roadworks. I don't think I went on the M6. So I think i went up here...and across...been on it too many times to know what it can be like. Too busy. I am good with names of roads. I relied on the SatNav to take me there...so I didn't have to think.”

?

“ Oh! I think I did go on the M6! I have got on the motorway haven't I? I think I went that way on the way back. So I went on the M6, and then down to that island. I think that was the way I meant to go, and I do remember going on that Sutton Road on the way back. The thing is, I hate the M6. But, you see when I was driving I would have been chatting to people on my phone, catching up with people.”



Only app data identified the error made in lack of recall of M6

Static maps (paper)



- Respondents can see SRN at a national / regional level
- Small scale = quickly provides broader context of area (e.g. Midlands)



- Small scale = very difficult to locate some sections of A roads (often depicted as tiny stubs of road) – especially in peripheral urban areas
- Respondents cannot locate where they may have joined / exited the SRN (esp. A roads) – and if it constituted part of SRN at all
- Lack of detail on slip roads and junctions means respondents remain uncertain on some sections of their journey recall (including motorways)



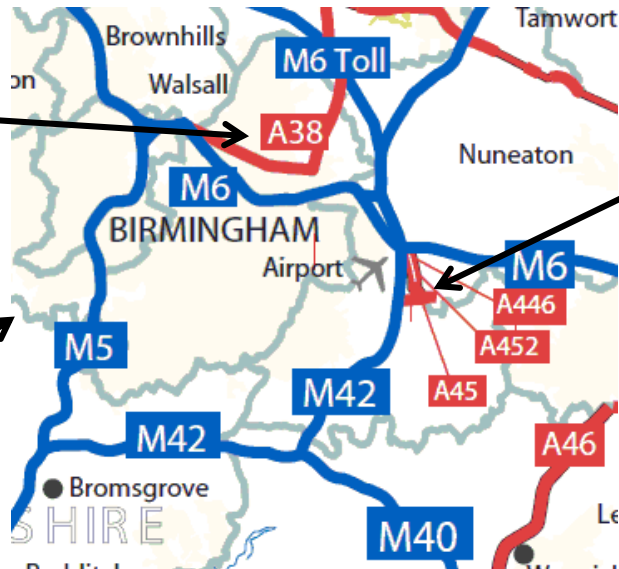
Static maps



A38 confusion – respondents know it extends much further but difficult to identify where exactly



Overall SRN depicted clearly at initial glance

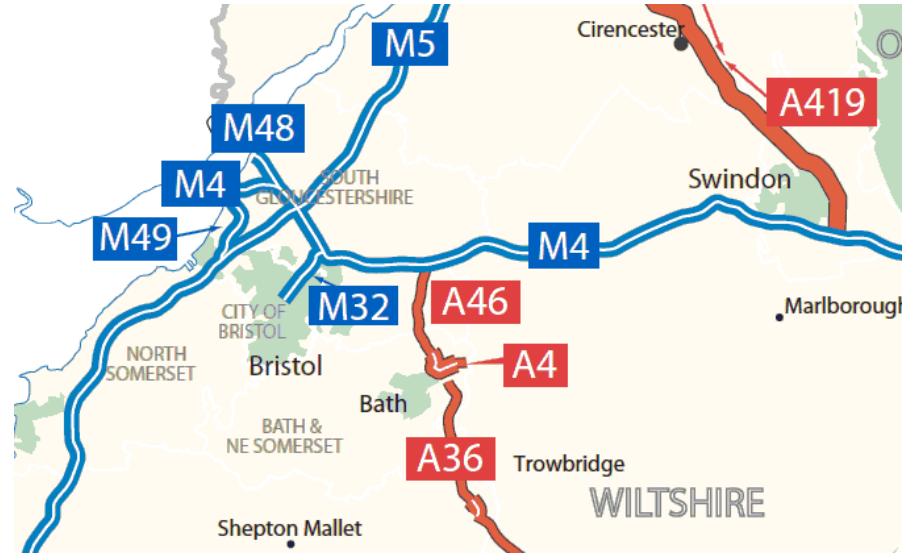


Clustering of small stubs of A roads – respondents confused as they know these roads are longer, but difficult to identify exact positions

Static maps prompt confusion as lack of detail does not assist respondents in identifying where they have travelled on sections of A roads

Static maps (digital)

- Essentially the findings were identical as for the paper maps (as it was the same map in a digital format)
- However, users typically expect to see a larger scale when zooming in – and this meant respondents were still limited in how they could identify sections of their journey
- There are no specific preferences for either the paper or static map



There is an expectation that digital maps will allow users to zoom in and reveal larger scale detail

Online interactive map



- Majority of respondents familiar with this format (esp. Google Maps and SatNav systems)
- Respondents either located general area and zoomed in, or typed in start and destination locations to reveal map / route
- Pan and zoom tools allowed respondents to identify specific details of their journeys – e.g. A roads, slip roads, landmarks, motorway junctions etc.
- Large scale provides reassurance that journey has mostly been accurately identified

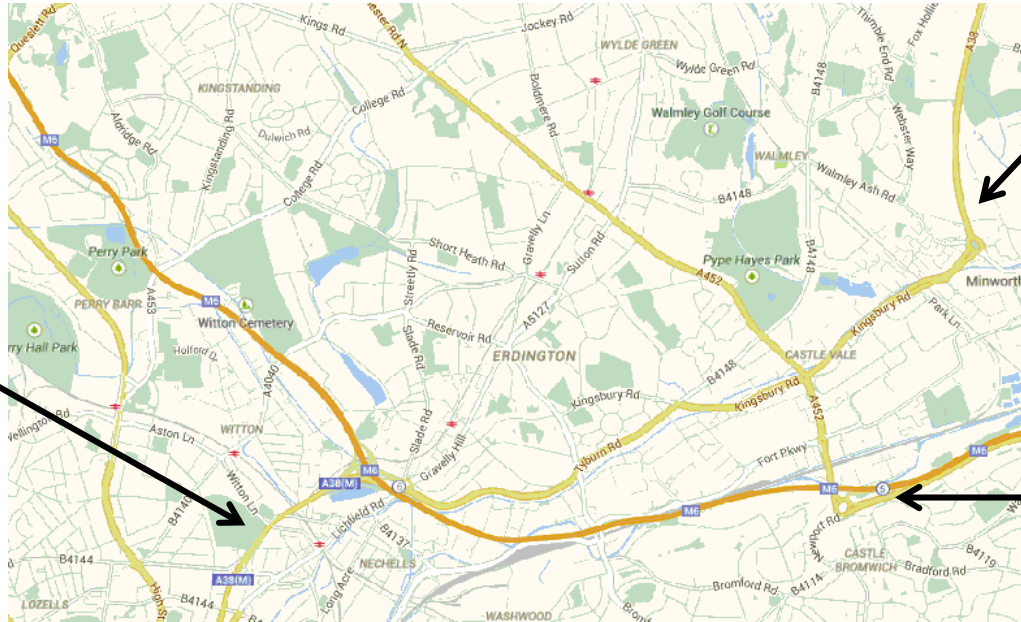


- Minority of respondents struggled when viewing detail at large scale, affecting their location awareness and journey identification
- Lack of colour-coding between SRN and other roads means SRN distinction lacks clarity at times
- Identification of journey takes longer (average time is 3 minutes 8 seconds) than using a static map (average time 34 seconds) – but results in greater accuracy

Online interactive maps allow users to view SRN and other road details

Online interactive map

A38 shown to continue past M6 and into Birmingham – but it is no longer the SRN (which causes some confusion)

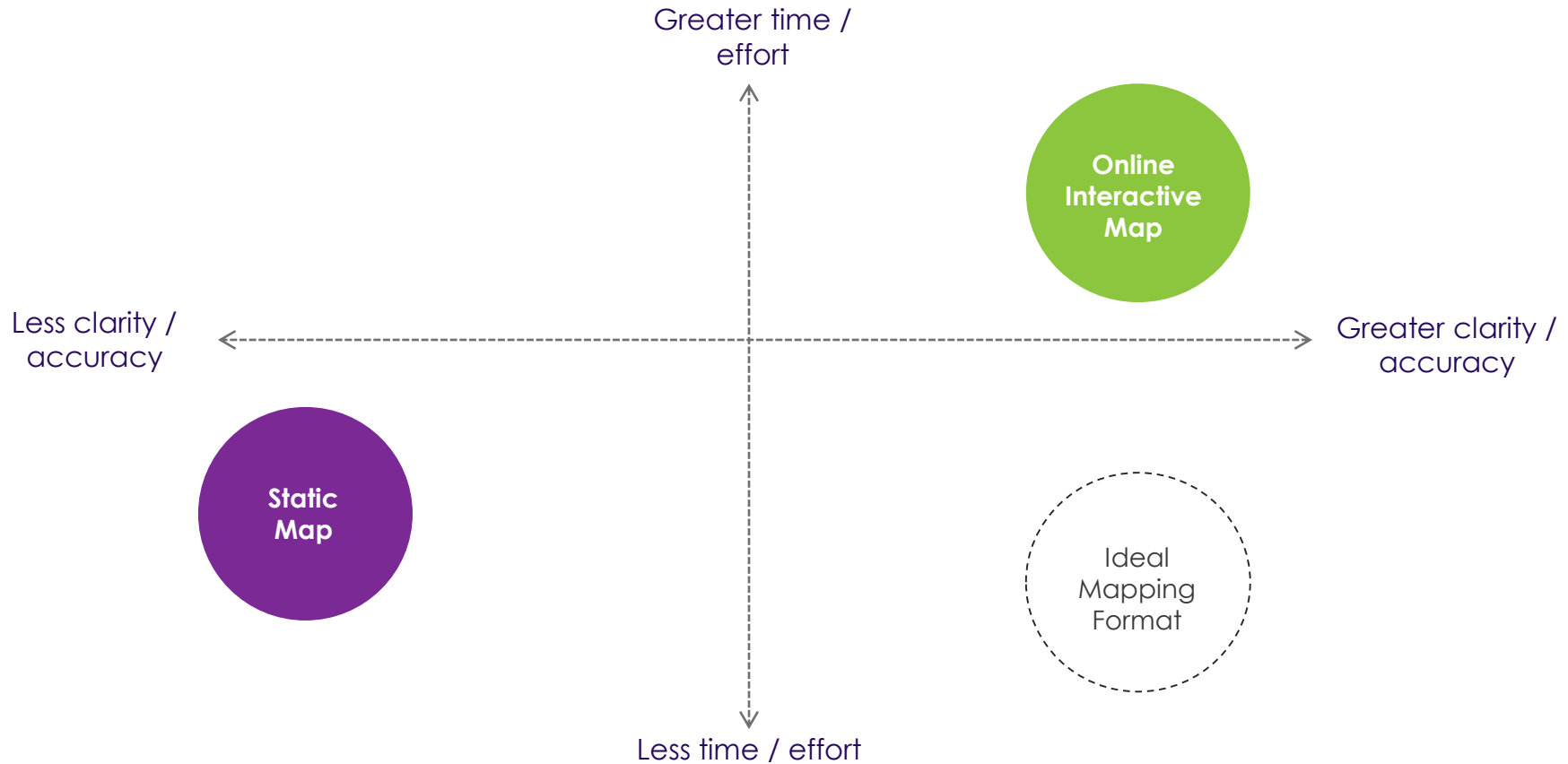


A38 shown
along with
alternative
local names

Junction
numbers
shown

Online interactive map helps users match informal road names with SRN

Mapping formats



Map format effectiveness



Online interactive map

- Large scale detail aids overall recognition
- Journeys accurately identified

- SRN lacks distinct differentiation
- Time to use is longer

Static map

- Overall SRN easily identified at first glance

- Lack of detail (esp. A roads)
- Larger scale expected when zooming in

Online interactive maps provide less SRN differentiation at first glance, but do enable users to pan and zoom to clarify their journey details

Most effective map format

“

I'd say the app and Google Maps...but I couldn't zoom in on the other maps (static), so I didn't know the names of the A roads.

[Male, 23]

”

“

The Google. Definitely. I do use that, especially when I go somewhere I don't really know. I get in and have a look around and see if I can find a building or a house and then I feel comfortable I know where I am going to.

[Male, 63]

”

“

It was on the laptop map - the Google one. It was just more visual, more explicit. there were more landmarks there for me to recognise, you just get your bearings better.

[Female, 55]

”

“

Google Maps. Definitely, yeah. The paper one and the one on the laptop, there aren't many roads...there are just A roads and motorways, but they don't show you the scale of miles on your journey. Like that one where I was on that road for miles - was just like a couple of millimetres of blue on that other map...

[Male, 32]

”

Respondents felt GoogleMaps was the most effective at clarifying their journey recall of SRN roads



The App used

TrackMyDrive app prompts considerable interest among respondents

- Overall respondents were impressed with the app
- Some confusion around the Auto on/off feature – which resulted in a small number of non-recorded journeys
- Some suggested an alarm / reminder to turn off after the journey
- Respondents enjoyed the journey distance and fuel consumption data, which also prompted further interest in other potential driving functionality
- All respondents are interested to participate in any future projects



When I was driving, I had my phone in my drinks holder, and it was saying how many miles I had done...that was really specific - 4.7 miles, it is quite nice to know how much distance you have been using.
[Male, 23, Midlands]



Journey recording app arouses curiosity – reflecting general interest among drivers around elements of driving (distance, route, fuel, time etc.)



Conclusions and recommendations



Conclusions and recommendations

Whilst online interactive is more accurate, it does not show the SRN

- The purpose of the research was to understand the factors that affect drivers' accuracy at recalling a recent trip, and in particular to examine the implications of moving maps online. Two different types of maps were compared – static online maps and interactive online maps.
- The research found that the majority of users are accustomed to panning, zooming and searching for locations and routes within applications such as Google Maps and SatNavs. However, these maps took drivers longer to find their route and to confirm it was on the SRN
- While the SRN is clearly marked on the static maps, drivers found difficulties identifying parts of the journey when only part of it was on the SRN. In some cases this led to errors in identifying their route
- The greatest scope for confusion appears to be in peripheral areas of large cities where there are more A roads and motorways
- **The optimum solution is likely to be a combination of detailed, online interactive mapping with the SRN highlighted as it is on the static maps – although this would require specific programming**
- **An alternative solution would be to produce zoomable static maps with non-SRN roads greyed out to assist identification of non-SRN parts of the journey**



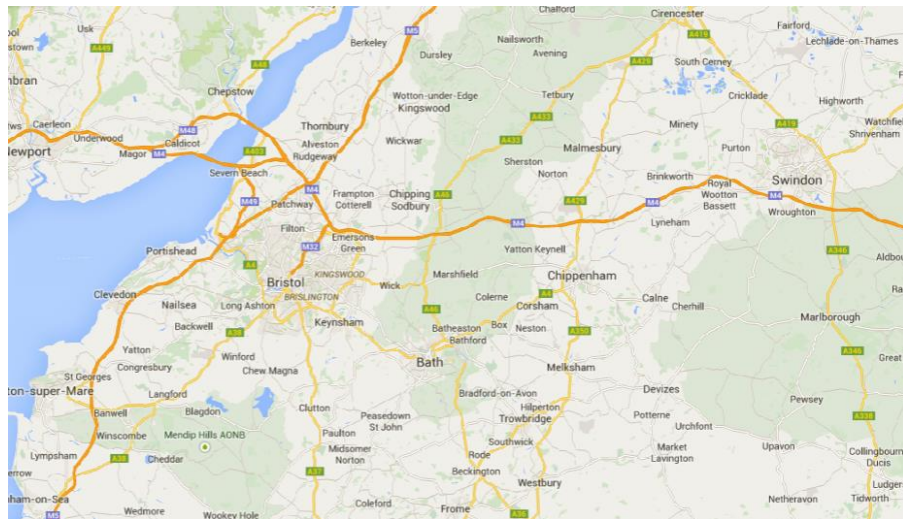
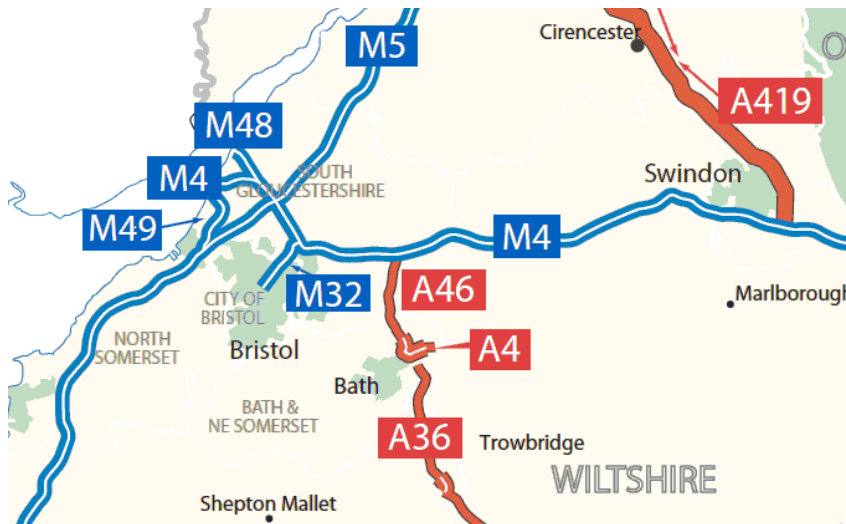
Conclusions and recommendations

Online interactive + SRN static = effective combination

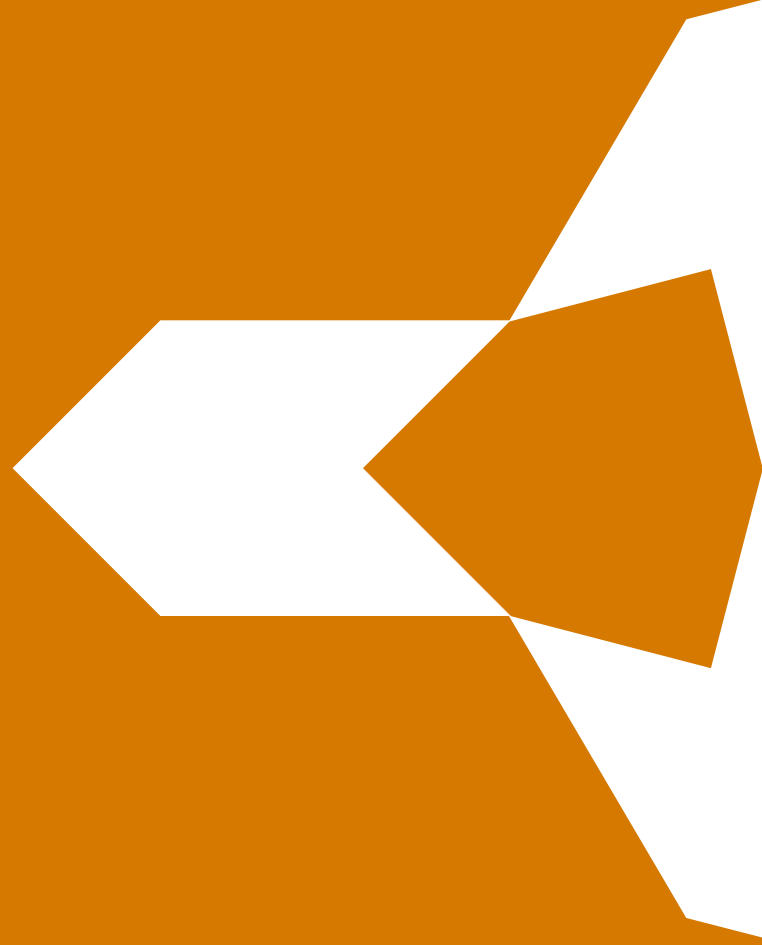
SRN differentiation clarity

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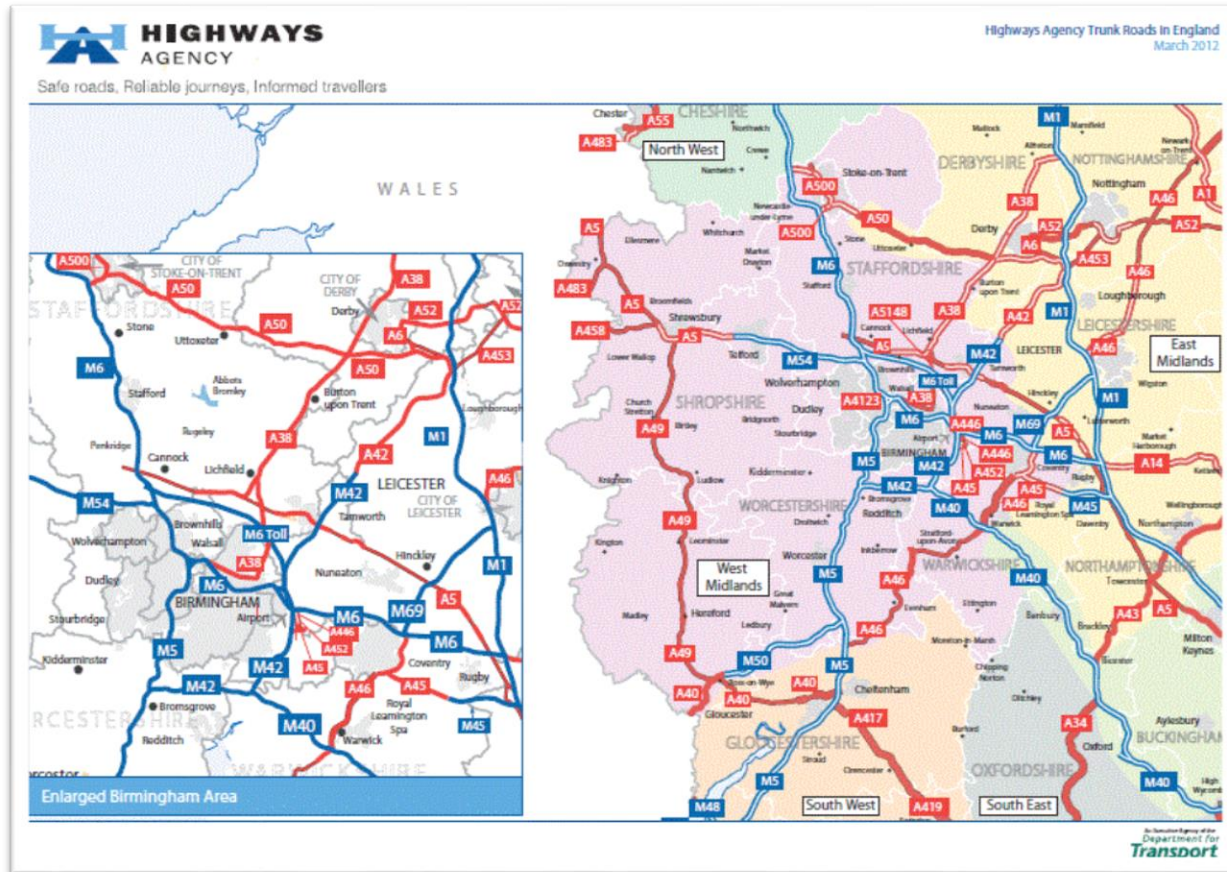
Scalability and detail



Appendix



Paper maps - Midlands



Paper maps - North



Paper maps – South West



Safe roads. Reliable journeys. Informed travellers.

Highways Agency Trunk Roads in England
March 2012

Paper maps – South East



Strategic Road Network

List of Roads

Motorways

M1	M27	M49	M6 Toll	M69
M11	M271	M5	M60	A1 (M)
M18	M275	M50	M602	A194 (M)
M180	M3	M53	M606	A3(M)
M181	M32	M54	M61	A308 (M)
M2	M4	M55	M62	A404 (M)
M20	M40	M56	M621	A627 (M)
M23	M42	M57	M65	A66 (M)
M25	M45	M58	M66	A74 (M)
M26	M48	M6	M67	

Trunk Roads (dual and single carriageway)

A1	A184	A3	A404	A452	A5111	A61
A1033	A19	A30	A405	A453	A5117	A616
A1089	A2	A303	A41	A458	A5148	A628
A11	A20	A31	A414	A46	A52	A63
A12	A2070	A3113	A417	A47	A55	A64
A120	A21	A316	A419	A483	A550	A66
A13	A23	A34	A42	A49	A556	A663
A14	A24	A35	A421	A5	A56	A69
A160	A259	A36	A428	A50	A585	A696
A168	A26	A38	A43	A500	A590	A74
A174	A27	A4	A446	A5036	A595	Dartford Crossing Bridge
A180	A282	A40	A45	A5103	A6	Dartford Crossing Tunnel

Recalling a journey

Wordle generated by language used when recalling journeys

