Should Wikipedia be embraced by the transport profession as an influential source of information on transport issues?

Dr Ben Clark
Research Associate
Centre for Transport & Society, University of the West of England, Bristol

Professor Glenn Lyons
Professor of Transport and Society
Centre for Transport & Society, University of the West of England, Bristol

Mr Peter Miller
Chief Executive Officer
ITO World Ltd, Ipswich

Abstract

Like it or not, Wikipedia has become an influential source of information for the public and for professionals on many subjects, including transport. Enter either 'high speed 2' or 'peak car' (a debate of increasing academic interest) into Google and the associated Wikipedia articles are ranked second and first respectively (10th July 2012). Such observations provide the context for this paper, which explores the implications of Wikipedia's increasing presence for the transport planning and research community.

The paper begins with a general review of academic studies of Wikipedia, uncovering the contested and unresolved debates around Wikipedia's credibility. The review reveals: the altruistic motivations of Wikipedia contributors; the remarkably small number of contributors accounting for most Wikipedia content; the internal hyper-linking that drives the high ranking of Wikipedia articles in search engine results; and, most significantly, the way Wikipedia is now being embraced as a mainstream information source in other disciplines – for example being widely used by both patients and doctors in relation to medicine.

The paper goes on to explore the extent to which Wikipedia is becoming a repository of transport knowledge. An audit of Wikipedia content confirms that the majority of nationally significant transport infrastructure schemes and transport debates (since the 1998 transport White Paper) are both covered on Wikipedia and the associated articles are ranked highly by Google. More detailed article case studies reveal the expected link between official information releases and increased article viewing and editing. Interviews with selected transport planners and researchers underpin the hypothesis that Wikipedia is indeed regularly read by transport professionals, but the professional community has not yet widely engaged in adding or editing Wikipedia content. On the basis of this exploration, the paper concludes by repeating Nature's (2005) call for transport professionals and researchers to "read Wikipedia cautiously and amend it enthusiastically".

1. INTRODUCTION

Like it or not, Wikipedia has undoubtedly become an influential source of information for the public and for professionals on many subjects, including transport. Enter either 'high speed 2' or 'peak car' (a debate of increasing academic interest) into Google and the associated Wikipedia articles are ranked second and first respectively (10th July 2012). Such observations provide the context for this paper, which explores the implications of Wikipedia's increasing presence for the transport planning and research communities.

The paper begins with an overview of the growing academic literature base relating to Wikipedia and its implications. It then presents a small scale empirical study of Wikipedia which included a review of the extent to which transport issues are covered on Wikipedia and expert interviews with selected individuals working within transport planning and research. Based on a review of this evidence, the paper concludes by arguing that the transport profession should indeed embrace Wikipedia as an influential source of information on transport issues.

A brief history of Wikipedia

'Wikis' are websites that enable web pages to be created, edited and extended by their users through standard web browsing software (Klobas 2006). Wikipedia is an online encyclopaedia which makes use of wiki principles and software. Articles in the encyclopaedia may be created and dynamically edited by the online community – i.e. anyone in the world with access to a computer and the internet. The Wikipedia website was launched in January 2001 by Jimmy Wales (an internet entrepreneur) and Larry Sanger (a philosophy student, employed by Wales to develop an online encyclopaedia). In its first year of operation, the open access principles of Wikipedia proved to be so successful that 18,000 articles were generated (Wikipedia 2012a)). Wikipedia has since continued to flourish. At the time of writing, the English language Wikipedia contains nearly four million articles (Wikimedia 2012a) and Wikipedia is ranked as the sixth most frequently visited page on the internet (Alexa 2012).

The rapid growth of Wikipedia as an easily accessible source of 'global knowledge' has prompted a number of academic studies into the online encyclopaedia's development and use. Such academic studies have sought to explore a range of issues which are now reviewed, including: the factors influencing article reliability; the characteristics of Wikipedia contributors and their motivations; the collaborative process of article development; factors influencing article popularity; and professional recognition of Wikipedia's presence.

How reliable are Wikipedia articles?

The reliability of Wikipedia articles, relative to traditional encyclopaedias, is a hotly contested issue, given that anyone can edit (and in some cases vandalise) an article at any given time. In contrast to traditional encyclopaedias, article edits are not strictly controlled, are not necessarily produced by recognised experts in the field, nor are they subject to peer review. Analogous to Darwin's theory of evolution, the quality of Wikipedia articles relies on the principle that, with the 'power of the crowd', poor quality edits will die, while good quality edits will be retained.

A number of research studies have sought to measure the reliability of Wikipedia articles. A high profile example is reported by Giles (2005) in the journal Nature. This study compared the accuracy of natural science articles in Wikipedia to those in the online version of the well established Encyclopaedia Britannica. 50 articles (from both encyclopaedias) on a range of topics were sent out to appropriate experts in the field for peer review. The experts were not told which article came from which encyclopaedia, and on average identified four inaccuracies in the Wikipedia articles, compared to three inaccuracies in the Britannica articles. This, Nature claimed, demonstrated that Wikipedia is nearly as accurate as Britannica (a claim that Britannica later went on to strongly contest (Britannica, 2006)).

There is conflicting evidence of the factors that influence the quality of Wikipedia articles. Some studies have found that articles with the most editors are of the highest quality (Wilkinson and Huberman 2007, Kittur and Kraut 2008), while others observe that article quality depends more on who contributes rather than on the number of contributors (Stein and Hess, 2007). Huvila (2010, p.5) reports the results of a study by Lih (2004) which reveals that article quality improves "after an article has been cited in the press". Ehman et al (2008, p.12) find that articles with the highest number of edits were not found to be of the highest quality (measured in terms of article richness, neutrality and readability). They note that "article quality in this collaborative encyclopaedia is primarily dependent upon the quality of contributions provided, rather than upon the quantity of contributions". Finally and of relevance to the field of transport planning, this study also revealed that soft science articles "performed the worst for quality as they had the lowest number of media objects and cited sources, the lowest degree of cross-linking and the least amount of balanced viewpoints" (Ehman et al 2008, p.15). However, arguably subjective values are more likely to impinge on soft science articles than they are on natural science articles in which objective 'facts' can be reported, supported by evidence derived from controlled experiments.

Flanagin and Metzger (2011) also explore the range of factors that influence the *perceived* credibility of Wikipedia relative to the encyclopaedia Britannica. They argue that perceived credibility is as important to understand as the objective accuracy of Wikipedia information (as studied by Giles (2005)) as it is possible that a range of 'external cues' (such as age, and

information context) are also likely to influence whether information from Wikipedia is perceived to be accurate or not. They conducted a large scale survey on a representative sample (n = 6738) of the United States' population and discovered that: 78 percent of children and 86 percent of adults correctly identified Wikipedia as 'an online encyclopaedia where anyone can contribute information'. Thus Wikipedia and how it operates is misunderstood by a significant minority of the US population. A higher than might be expected proportion of respondents, 12 per cent of children and 9 per cent of adults reported having edited an article, though most also indicated that such editing was a rare occurrence. They also revealed that information context has an important influence over its perceived credibility - Wikipedia content was viewed as being more credible when it was presented on an Encyclopaedia Britannica style page. This leads the authors to conclude that currently at least, across all age groups "perceptions of credibility are strongly anchored in the idea of expert-generated (or vetted) content" (Flanagin and Metzger 2011, p.371). They also note however, that "younger users also found the user-generated content to be superior, but only when there were unaware that it had been user-generated". This, they suggest, hints that future generations may become less and less sceptical of user generated 'knowledge' such as that developed through Wikipedia.

Who contributes to Wikipedia and why?

Kuznetsov (2006) explores the "Motivations of contributors to Wikipeda" using secondary sources (the free/libre and open source software survey and study, and the SETI@home volunteer poll) as well as a small pilot survey of students of New York University. She puts forward five values that underpin the motivation to contribute to Wikipedia: 1. Altruism - contributors derive pleasure from others benefiting from their work, though she suggests that most contributions are not motivated purely by altruism. 2. Reciprocity - drawing on Trivers (1971) model of reciprocity, Kuznetsov (2006, p.4) suggests that "altruistic individuals who interact over a long period of time mutually benefit from their altruism". 3. Community – The Wikipedia project and work environment fosters collaboration towards a common goal which is enjoyed by Wikipedians. They come to feel needed by the Wikipedia community. 4. Reputation building – Successful contributions allow a positive Wikipedia reputation to be acquired; and 5. Autonomy – Wikipedians are their own boss, being free from the constraints of a typical work environment.

How are Wikipedia articles developed?

There is a small body of research exploring the process through which Wikipedia articles are developed. Ehmann et al (2008) created nine new Wikipedia articles (three in each of the disciplines of hard science, soft science and the humanities) and monitored how the articles evolved over a five month period. Their results confirmed what has been termed 'first mover advantage' whereby initial text tends to remain and forms the 'backbone' of the article. In providing this structure and a long lasting textual core, article creators were observed to have a significant influence over how pages subsequently evolve. This indicates that it is in the interest of professional editors to create new articles as this content is likely to be retained. A further observation was that article talk pages were found to be influential in shaping how a page evolves – points raised on the talk pages often subsequently resulted in related page edits. This reveals the importance of online collaboration within the Wikipedia community in the evolution of Wikipedia articles.

What articles are popular in Wikipedia and why?

Spoerri (2007) investigated what categories of Wikipedia articles were the most frequently viewed over a five month period between September 2006 and January 2007. Counter to his expectation that typical encyclopaedic topics would be the most popular, Spoerri discovered that articles relating to entertainment were the most frequently viewed (comprising 43 per cent of all Wikipedia hits). The categories 'politics and history' (15 per cent), geography (12 per cent) and sexuality (10 per cent) were the next most popular, together constituting a further 37 per cent of total page views. The study further revealed that popular topics on Wikipedia overlapped considerably with the most frequently used internet search terms over the same period. Moreover, when article titles were submitted to internet search queries, Wikipedia articles were observed to rank highly in the search results. For instance, 87 per cent of the most frequently viewed Wikipedia pages were returned in the top three result positions by Google (when searched for by article title). This strongly suggests that internet

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search engines drive a significant proportion of internet traffic to Wikipedia (in contrast to users 'pre-planning' visits to Wikipedia).

In this regard, there is some debate amongst the online community concerning why Wikipedia is ranked so highly by search engines; including some speculation as to whether Wikipedia receives preferential treatment in search engine algorithms (Google in particular, given their active and financial support to the Wikipedia project (Intelligent Positioning 2012)). However, there are several plausible technical reasons why Wikipedia is intrinsically highly optimised to rank highly in search results. Key search terms are highly likely to appear in article titles as well as throughout the article itself. Wikipedia articles are also highly internally linked to one another and, as the Wikipedia project has gained traction, Wikipedia is now regularly linked to from external websites. These key parameters are used by search engine algorithms to index and rank sites across the internet (SEOBook 2007, Google 2012), resulting in Wikipedia's success in ranking highly in search results.

Professional recognition of Wikipedia's presence

The undoubted significance of Wikipedia has now begun to be recognised in professional spheres, perhaps most notably within the medical profession. The availability of online information has changed the patient-doctor relationship, given that patients are now able to access a range of health information sources online (with a range of reliability), before / as well as consulting their General Practitioner. One study indicated that 52 per cent of the European population used the World Wide Web for 'health purposes' in 2005 (Kummervold et al 2008). Perhaps more significant is the suggestion that up to 50 per cent of American doctors use Wikipedia as an information source (in some way) to assist in providing medical care (Comer 2009).

Statistics such as these prompted Laurent and Vickers (2009) to ask "does Wikipedia matter?" in the quest for health information online. They measured how Wikipedia articles on health matters were ranked by search engines (including Google) relative to official sources of health information such as MedilinePlus and NHS direct. Their findings revealed that the Wikipedia content ranked higher than both MedilinePlus and NHS direct. Moreover, they found that "Wikipedia articles were viewed more often than MedlinePlus" (Laurent and Vickers 2009, p.471). Such results would suggest that Wikipedia is now having considerable influence as a source of online health information.

With this in mind, a group of early adopters of Wikipedia, many of whom work within the medical profession, have seized the initiative in creating the WikiProject Medicine (Heliman et al 2011). WikiProjects provide a mechanism through which editors with a shared interest can collaborate. Heilman et al (2011, p.6) pose the question: "why not adopt Wikipedia as the platform for the global medical knowledge databases?", in place of alternative online medical database, given that Wikipedia is already the 'market leading' online information source. They also suggest ways of incentivising health professionals to contribute to Wikipedia, by for instance, awarding credits for Wikipedia contributions as part of continuing medical education. They cite the journal, RNA Biology, as a 'best practice' example of a scientific journal that requires authors to also update the "relevant Wikipedia entry". And go further by suggesting that academic journals could "enhance their 'social impact factor' by requiring authors to review a related Wikipedia entry" following publication (Heilman et al 2011, p.7).

The academic and education sectors have also begun to recognise the implications of Wikipedia's presence. Willinsky (2007) argues that Wikpedians should cite open access academic sources in favour of restricted access sources so that readers have easy access to reliable follow up references. Furthermore he suggests that academics should facilitate this process by making their research freely available online using University e-repositories or open access journals. Returning to the Nature (2005) study which suggested that Wikipedia appeared not to be substantially less reliable than Britannica, an editorial in the same issue furthers the argument that the expert community should "read Wikipedia cautiously and amend it enthusiastically" (Nature 2005, p.890).

Summary

This review of academic literature has uncovered the contested and unresolved debates around Wikipedia's credibility and further revealed: the altruistic motivations of Wikipedia contributors; the remarkably small number of contributors accounting for most Wikipedia content; the internal hyperlinking that drives the high ranking of Wikipedia articles in search engine results; and, most significantly, the way Wikipedia is now being embraced as a mainstream information source in other disciplines – for example being widely used by both patients and doctors in relation to medicine. The review has also reaffirmed the rapid ascendancy of Wikipedia in its first decade and the extent to which it is now an object of research.

2. A STUDY OF WIKIPEDIA AND THE TRANSPORT PROFESSION

The paper now moves on to present a small scale piece of primary research which set out to explore the implications of Wikipedia's presence, specifically to the transport planning and research professions. It is notable that Wikipedia did not exist at the time of the 1998 transport White Paper (Department for Transport 1998), often cited as a key turning point in transport policy. Given that the English language Wikipedia now contains nearly four million articles (Wikimedia 2012a), the starting point for the study was the hypothesis that Wikipedia is now likely to be a highly ranked source of online information relating to transport including: the transport network and proposals to change it, wider transport policies and indeed theoretical concepts relating to transport planning and engineering. With this hypothesis in mind, it was considered relevant to explore the extent to which transport issues are covered on Wikipedia, how Wikipedia content relating to transport is generated and the frequency with which it is viewed. Consideration of these issues was intended to shed light on the implications of Wikipedia's presence on the process of transport planning, policy making, research and education. Clearly, it remains to be seen how the role of Wikipedia will change as it evolves through its second decade.

The study involved both a Wikipedia content audit and a set of interviews with professionals working within transport planning and research. To inform the Wikipedia content audit, a list of planned (road, rail and air) schemes of national significance was first compiled from official sources including: the Highways Agency's Future Delivery Programme (Highways Agency 2012); Network Rail's track and station improvement schemes (Network Rail 2012a, Network Rail 2012b, Network Rail 2012c, Cross Rail 2012, Network Rail 2012d); and airport schemes detailed in the Future of Air Transport white paper (Department for Transport 2003). A timeline of important events, policy debates and developments in the transport domain since the 1998 transport White Paper (Department for Transport 1998) was also compiled (partially informed by Chatterjee and Dudley (2008)). Wikipedia was then searched to establish how many of the infrastructure schemes and timeline events were documented. A secondary test was performed to establish the Google page ranking of Wikipedia articles associated with transport infrastructure schemes. Scheme names from official sources were used as the Google search term. The content audit and ranking tests were performed in June 2012. A small number of articles were interrogated in further detail to establish level of page viewing, how article content had evolved and to establish any typical characteristics of the article editors (by exploring contributor user pages).

The views of the profession were examined by conducting a small set of expert interviews, in June to August 2012, with selected individuals from different sectors within the profession (Table 1). These were recruited via a posting on the Universities' Transport Study Group mailing list and through snowballing through professional networks. The interviews explored level of use of Wikipedia in a professional and personal context, views on advantages and disadvantages of Wikipedia, experience and views on editing Wikipedia content, and consideration of the implications of Wikipedia's presence to the transport planning community.

Table 1: Interviewees – transport experts

Name	Professional role
John Austin	Independent Transport Planning Consultant
Steve Melia	Academic researcher and lecturer
Chris Nichols	Independent Transport Planning Consultant
Bob Pinkett	Partner, Peter Brett Associates (transport planning and engineering consultancy).
Peter Sykes	Independent Transport Planning Consultant and PhD student

The extent to which transport issues are documented on Wikipedia

The results of the Wikipedia transport content audit are summarised in Table 2. Overall the great majority of planned national transport infrastructure schemes were found to be documented on Wikipedia to a greater or lesser extent. Wikipedia articles on rail and airport schemes were ranked at least as high as fifth by Google – confirming Wikipedia's significant presence as a source of online information on transport schemes. The average ranking for road schemes was lower but ranged from as high as third, down to 146th for a lesser known scheme (widening of the A453). Nevertheless, it was not atypical for road schemes to be highly ranked - 10 of the 21 schemes documented on Wikipedia appeared in Google's top 10, while 15 of the 21 schemes appeared in Google's top 15 links.

Table 2: Wikipedia Transport Content Audit

Audit item	No. of schemes identified	No. documented on Wikipedia	Average Google search rank
Road schemes	28	21 (75%)	30 (SD 45)
Rail track schemes	23	20 (87%)	5 (SD 21)
Rail station schemes	11	10 (91%)	4 (SD 4.9)
Airport schemes	21	21 (100%)	3 (SD 0.8)
Historical timeline	63	50 (79%)	Test not performed

The content review also revealed that there is a very active community of Wikipedia editors creating content relating to transport infrastructure. Dedicated Wikipedia articles exist for all of the UK roads for which schemes are proposed, though not all articles document proposed developments. Five of the seven road schemes not documented on Wikipedia related to capacity management rather than capacity expansion, indicating that such schemes may be less eye catching to Wikipedia editors. The majority of the road schemes identified on Wikipedia tended to have a brief entry on the associated article under a 'proposed developments' heading or something similar. More significant schemes, such as the Hindhead Tunnel development (on the A3 near Guildford), have their own dedicated article. Nevertheless, the Highways Agency's own website currently offers comprehensive coverage of proposed road schemes and is also ranked highly by Google. This offers a clearly structured page for all planned schemes, providing status updates and a range of easily navigable information. Thus official information on road schemes is easily accessible and is complemented by rather than competes with Wikipedia articles (which are suited to situating proposals in the historical context of the road). Railway lines and stations similarly have a dedicated article on Wikipedia. The more significant rail schemes such as Cross Rail and the High Speed Two rail link have a dedicated page, while smaller schemes are mentioned as subsections of related articles. Again, it is notable that official information is also highly accessible and ranked highly by Google. The Network Rail website currently provides comprehensive coverage of proposed schemes, offering a clearly laid out dedicated web page for all scheme proposals. The more significant infrastructure schemes – the High Speed Two rail link and Cross Rail – also have detailed official websites.

In comparison to road and rail schemes, official information on airport expansion was much harder to source. This is likely to be attributable to the political controversy surrounding currently shelved plans to build additional runways at London Heathrow and Stansted airports (i.e. a political decision had been taken not to publish an official line on airport expansion). At the time of writing, the only document detailing specific plans for UK airports was the 2003 government White Paper (Department for Transport 2003) though this has been archived following the change of administration in 2010. Wikipedia however, offered an easy to navigate one stop shop of information on airports (with a dedicated page for each airport) which for each airport provided some information on proposals for development. This indicates that Wikipedia fills a vacuum in cases where official information is lacking. A potential consequence, given Wikipedia's open editorial policy, is that particular viewpoints on contentious issues such as airport expansion are given a higher profile online through the Wikipedia platform, than would otherwise be the case.

Article histories, page viewing statistics and the user accounts of contributors were explored in detail for a small subset of articles. This revealed that on fast moving topics such as decisions relating to the proposed high speed two rail line, external announcements and media reports prompt both editing activity and significant page viewing. Indeed, relative to traditional print encyclopaedias and other media, the Wikipedia platform proves to be adept at managing information relating to rapidly changing issues. Although 'first mover advantage' was not observed, in support of Ehmann et al's (2008) study these case studies also suggested that while many editors may be involved in content creation, the majority of article content is created by a smaller handful of influential editors. In this regard, although the allowance of anonymous editing on Wikipedia prevents a detailed analysis of user characteristics, it would appear at least that there is some engagement with transport content on Wikipedia from professionals working within the transport domain. For instance five of the 28 editors of the 'Road Pricing' article declare a professional interest in transport planning on their user pages. Article talk pages were observed to reflect the controversial nature of some aspects of transport planning and research and demonstrated that Wikipedia editing is a non trivial process. Diplomacy and mediation is required to settle disputes and to avert editing wars. This indicates that professionals engaging with Wikipedia for the first time would benefit from guidelines on how to contribute effectively. Articles were also observed to be 'tagged' to request help from experts in the field. This further indicates that Wikipedia would indeed benefit from a mechanism through which wider engagement from the transport planning and research professionals can be sought.

The views of transport planning and research professionals

Wikipedia use: As might be expected, the interviewed professionals all described having looked up information on Wikipedia, both in their personal and professional lives. Steve Melia explained that "the main purpose of Wikipedia is signposting" to source material and this was corroborated by other interviewees. Pete Sykes described Wikipedia as a useful "reference farm" and added that in contrast to academic literature reviews, a particular strength was that Wikipedia cited a wide range of reference types, including for example popular media or professional journals. John Austin agreed, noting that Wikipedia "can sometimes lead you to areas that you haven't heard about". In this regard Wikipedia was identified as being a good synthesizer of information from multiple sources.

Wikipedia was also noted as being particularly useful for quickly sourcing background facts and figures and specifically *place oriented information* that may be particularly relevant to understanding transport issues - for instance population statistics, and local geography and history. This was noted by both academic researchers (Steve Melia) and transport planning practitioners (Chris Nichols). Chris Nichols explained "when you're doing a transport assessment, it's always useful to get a bit of background on a local area. It [Wikipedia] will tell you what's relevant; give you the highlights which you can then validate through more targeted research".

Wikipedia's highly visible and increasing presence in search engine results was also identified and noted as a reason why use of Wikipedia is becoming an unavoidable part of information searching online. Chris Nichols described Wikipedia as "part of the Google furniture" and noted that "when you search for things it's almost ever present". Pete Sykes agreed and further identified that "one thing about consultancies is that they don't tend to have access to the same level of library access as the university students and staff do. That means the first port of call is Google and pretty quickly on Google you tend to find the

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Wikipedia article". This again demonstrates how Wikipedia tends to fill a vacuum when accessible information is lacking and suggests that this may be the case in consultancy environments, where access to alternative online resources is limited by project budgets. This perhaps strengthens the case for academic research to be made freely available online for use by professionals as well as potential Wikipedia editors, a policy being pursued by the current Government which is committed to making publically funded scientific research available for free by 2014 (Department for Business Innovation and Skills 2012). It further illustrates the increasing importance of trustworthiness in relation to information on Wikipedia.

Trustworthiness: Indeed, the extent to which transport content on Wikipedia is trustworthy and credible was a repeated theme through the small set of interviews. Some noted scepticism regarding who has written the content, given the anonymous nature of Wikipedia editors. Bob Pinkett explained "the one thing you want in social media is the authoritative voice...that trusted voice and the difficulty is because of the anonymous nature of Wikipedia, ironically it doesn't help them. You know if it was [a respected professor of transport] had his tag line on a section that had been written then I'd feel a bit happier about it, but I don't know if it's a car mechanic or a brilliant professor or a politician with an act to grind". Bob went on to comment on the "value laden" nature of some Wikipedia articles, noting that "people will be using it [Wikipedia] as a forum to further a point of view. On these big politicised projects [road or rail schemes for instance], then these sorts of concerns come in".

Conversely, John Austin felt that Wikipedia was relatively more trustworthy for other types of 'objective', technical knowledge that was less likely to be influenced by subjective values. He explained that content relating to scientific definitions was on the whole fairly reliable: "My experience is that in areas where there are if you like nerds, Wikipedia is very strong. Particular specialisms that might have a strong following by some people, you tend to find that the information is quite detailed. My inclination is that it is quite good in those fields". There were also some cautious suggestions that the credibility of Wikipedia content has improved in recent years. John Austin noted that "my perception is that it's getting better in terms of accuracy, but I've got no evidence for that".

In taking cognisance of Wikipedia's unavoidable high profile online and the need to think critically about its content, some of those interviewed identified a need to educate staff and students about how to use Wikipedia effectively. In a consultancy context, Bob Pinkett recognised occasionally some younger, inexperienced staff "literally cut and paste from it [Wikipedia] as though it's a trusted source", requiring him to emphasise the need to "go back to the original [source]". He added "older people who aren't social media savvy might actually be using it in the wrong way [too] so I don't think it's a necessarily old and young thing". In relation to academic tutoring of the next generation of transport planners, Steve Melia noted that "some people might have taken a view which is to advise students never to look at Wikipedia". However he counters this argument, recognising that Wikipedia can be a useful resource for students. He advises them to "by all means use Wikipedia for signposting; don't rely on it solely, signpost and then when you come to cite something go back to the original source".

Professional engagement: On the whole, those interviewed had little or no experience of editing Wikipedia articles relating to transport topics. Pete Sykes described an intriguing example of how Wikipedia had been used (arguably inappropriately) in the past for commercial reasons. He was aware of transport modelling software developers becoming engaged in an 'editing war', using transport modelling articles on Wikipedia to gain a competitive advantage online. Bob Pinkett described having once edited an article in the 'early days' of Wikipedia (2006) relating to bus deregulation. He was motivated by the observation that "80 per cent of it [the article] was factual but about 20 per cent of it was value laden insofar as it said that bus deregulation had been a failure outside of London". Bob adjusted the article to present a more balanced overview, including references to some positive success stories such as Brighton and Oxford. He observed during the interview that his edits had been retained some six years later, suggesting that high quality content added by experts is indeed valuable and will survive.

Nevertheless, there was little appetite amongst the majority of the interviewees for further editing engagement, perhaps understandably so given the pressures on professional's time. For instance Bob Pinkett commented that "I've never done it [edited a Wikipedia article]

since [2006] because life is too short basically". Similarly, Chris Nichols explained that "I've never really felt the urge to, to be quite honest. I have come across ones that are badly written, but I've just thought no I'd rather not. You can edit something and somebody else would disagree with the way you've done it". By way of a contrast Steve Melia has edited Wikipedia on several occasions, although still relatively infrequently. He noted that "one of the big problems with academic publications is that very few people outside the academic field actually read those publications. So how do people in the wider world actually get to know about the existence of a concept?" In addition to assisting with the wider dissemination of academic research, Steve further explained that Wikipedia provides a useful environment for "placing the concepts [deriving from academic research] in the appropriate part of the debate"; given Wikipedia's adeptness at offering links to related topics.

Indeed, Pete Syke's observation reported earlier, that consultancies often have limited access to academic sources, would perhaps confirm that there is a role for academics to summarise their research output on Wikipedia. Nevertheless, the issue of whether the transport planning and research professions should engage more actively in the generation of Wikipedia content was clearly something that had not been considered in depth by those interviewed, prior to the interviews at least. This would indicate that the implications of Wikipedia's presence is not currently a highly prescient issue amongst the profession. There was however, a general acceptance that social media should not be ignored. John Austin commented that "I think those that have a particular interest in and professional knowledge of something ought to be engaged with Wikipedia. Perhaps there are a large number of us that ought to be doing that". Bob Pinkett further suggested that the profession could take advantage of Wikipedia's success as a high profile online information source: "That's why the model is good. Do you go to the channel where everyone already is or do you create your own channel? If the Transport Planning Society created a transport planning wiki I don't think they'd get half the stuff in...You don't create a new platform to take on Facebook, Twitter or Linkedin, what you do is you go to established places and you play by the rules". This might suggest an opportunity to move content from existing platforms such as the Victoria Transport Policy Institute's (VTPI) online Travel Demand Management encyclopaedia (VTPI 2011) into Wikipedia.

Should transport professionals engage with Wikipedia (and if so how)?

The paper now turns to directly address the question posed in the title of the paper – Should transport professionals engage with Wikipedia (and if so how)? Peter Miller, a co-author of this paper, both works professionally within the transport community and regularly edits Wikipedia articles relating to transport. Peter thus offers the perspective of an experienced Wikipedian who would like to see further engagement from within the transport planning, engineering and research professions. It is his views and experience that are largely drawn upon in this section. To give context to the discussion, Peter was first prompted to edit a Wikipedia article five years ago in order to correct mistakes relating to an issue of personal interest. Given his keen interest in local transport issues and internet technologies, it subsequently occurred to him that Wikipedia could become a powerful platform for the dissemination of information relating to transport developments and policies.

When searching for information relating to transport policies (on and offline), the public are arguably faced with three views, being put forward by 1. the scheme promoters, 2. groups protesting against the scheme or 3. the general media. Each of these perspectives is inherently biased in one way or another: Policy promoters have little incentive to draw attention to weaknesses in a scheme. Protestors have little incentive to highlight the strengths of a scheme. Finally, the media have a tendency to over emphasise the emotive side of a story in an effort to sell newspapers. By way of a contrast, Wikipedia aims in principle at least, to offer a platform for neutral, balanced and verifiable information relating to transport issues, though the open access nature of this platform is clearly open to abuse. Nevertheless, Peter's experience of editing Wikipedia content relating to transport has generally been positive. Expert contributions are both valued by other contributors, and on the whole retained. On the other hand, it is also typical to experience episodic difficulties with collaborators putting forward particular points of view, often apparently arising from specific advocacy groups. Consequently, an important aspect of Wikipedia editing is learning how to negotiate disputes effectively using article talk pages.

Notwithstanding these occasional difficulties with negotiating the editing process, Peter's experiences and the evidence produced by this small scale study suggests that it *would* be

appropriate for there to be further professional engagement with Wikipedia. Given the high profile of transport content on Wikipedia evidenced by this small scale study, it is arguable that professionals should take responsibility for ensuring that such content is of an acceptable quality. That is not to say however, that every academic or practitioner should learn how to edit Wikipedia. Experience indicates that editing Wikipedia can be a non-trivial process involving a considerable time investment. There are also potential issues with professional conflicts of interest, running counter to Wikipedia's basic principles of neutrality, verifiability and no original research. For instance, a transport planner involved in the promotion of a particular scheme could find it difficult to add neutral content to an article relating to that scheme. In such cases, professionals could instead suggest technical content on the article talk page. Similarly, academics can legitimately cite their own papers on Wikipedia, as long as the work is relevant and self promotion is not evident (Wikipedia 2012b).

The process of editing Wikipedia articles further highlights a recognisable need for professional expertise to assist the Wikipedia community. Wikipedia articles are often flagged as needing expert attention. However, such requests are likely to remain within the 'closed' Wikipedia community and there is no formal mechanism through which experts outside of the Wikipedia community can be contacted. However, effective profession wide collaborations between Wikipedia editors and professional communities could be facilitated by formalising relationships between the Wikimedia Foundation (the charitable body that oversees Wikipedia and a range of other wiki projects) and the professional bodies such as the Transport Planning Society. Such professional institutes can take ownership of and promote an objective to improve Wikipedia content relating to their specific discipline amongst their members. This can be facilitated by providing guidelines on how to edit Wikipedia and hosting periodic events to foster mutually beneficial collaborations between Wikipedia members and professionals.

Indeed, this approach is already being pursued within various other professional sectors. One of the most established relationships is managed through the GLAM-wiki project (Wikimedia 2012b). This project supports Galleries, Libraries, Archives and Museums who wish to promote "open access, freely-reusable content for the public" and incorporates an annual conference to encourage collaboration with Wikimedia projects. Of perhaps more relevance to the transport planning and research community is the finding that, having been prompted by the GLAM initiative the Institute of Civil Engineers have this year initiated a programme of activities to encourage professional engagement with Wikipedia (ICE 2012a). Their aim is "to improve content in the civil engineering area" (ICE 2012b). The programme of activities is expected to include the provision of a briefing sheet as a guide to Wikipedia editing (how to avoid conflicts of interest and so on) and a guest editor day through which experienced Wikipedia editors meet civil engineers to assist in editing articles on civil engineering (ICE 2012c). By way of a contrast, the Chartered Institute for Public Relations (2012) has published 'Guidance for Public Relations Professionals Using Wikipedia' which actively discourages their members from directly editing Wikipedia content as part of professional public relations activities in order to avoid conflicts of interest arising. This nevertheless offers a further example of a professional body recognising the implications of Wikipedia's presence and the consequent need to offer guidelines to practitioners.

3. Concluding summary

This study set out to test the hypothesis that Wikipedia is likely to be a highly ranked source of online information relating to transport. Although being recognisably limited in scope, the literature review and small scale primary study would suggest that this hypothesis is indeed true. Transport issues are widely documented on Wikipedia and the articles are typically highly ranked by search engines. It follows therefore, that all professional bodies, should ensure that Wikipedia is of a good standard in their area of interest. The user accounts of key contributors to selected articles on transport topics suggested that there is already a level of voluntary engagement from within the profession, whilst on the other hand, the interviews indicated that this engagement is not likely to be widespread. Nevertheless, the suggestion that greater professional participation could be encouraged was generally positively received by those interviewed.

Based on this evidence, we would recommend that a suitable mechanism through which professional engagement should and can be encouraged, is by formalising a relationship between the Wikipedia community and professional institutions such as the Transport Planning Society - an approach that is already being adopted by other professional spheres, including the Institute of Civil Engineers. Indeed, the finding that other professions are actively offering guidance to members on how to interact with Wikipedia, serves to legitimise the claim that Wikipedia's presence should not be ignored. Finally, it is at this stage useful to remind ourselves of Wikipedia's worthy intention to provide a platform through which "every single human being can freely share in the sum of all knowledge" (Wikimediafoundation 2012). An enlightenment ideal that is becoming increasingly possible through the wide spread availability of internet technology. With this in mind, and in offering a positive response to the question posed in title of this paper - should Wikipedia be embraced by the transport profession as an important source of information on transport issues? - the paper concludes by repeating Nature's (2005 p.890) call for transport professionals to "read Wikipedia cautiously and [to] amend it enthusiastically".

References

Alexa (2012) Top Sites [online] Available from http://www.alexa.com/topsites [Accessed 29th May 2012].

Britannica (2006) Fatally flawed – Refuting the recent study on encyclopaedic accuracy by the journal Nature. [online] Available from http://corporate.britannica.com/britannica_nature_response.pdf [Accessed 31st May 2012].

Chartered Institute of Public Relations (2012) Best practice guidance for public relations professionals. London: Chartered Institute of Public Relations. Available from http://www.cipr.co.uk/sites/default/files/CIPR_Wikipedia_Best_Practice_Guidance.pdf.

Chatterjee, K. and Dudley, G. (2008) Time series information and pivotal events. In: D. Tarrant and A. Lovell, eds. Conference for the Institution of Highways and Transportation: With the Advantage of Hindsight, Portsmouth 26th August 2008. Institute of Highways and Transportation, pp 5-89.

Comer, B. (2009). Docs look to Wikipedia for condition info: Manhattan Research [online] Available from http://www.mmm-online.com/docs-look-to-wikipedia-for-condition-info-manhattan-research/article/131038/ [Accessed 2nd July 2012].

Cross Rail (2012) Cross Rail [online] Available from http://www.crossrail.co.uk/ [Accessed 13th July 2012].

Department for Business Innovation and Skills (2012) Government to open up publicly funded research [online] Available from http://www.bis.gov.uk/news/topstories/2012/Jul/government-to-open-up-publicly-funded-research [Accessed 29th August 2012].

Department for Transport (1998) A New Deal for Transport - Better for Everyone. London: Department for Transport.

Department for Transport (2003) The Future of Air Transport. London: Department for Transport.

Ehmann, K., Large, A., Beheshti, J. (2008) Collaboration in context: Comparing article evolution among subject disciplines in Wikipedia, First Monday, 13(10).

Flanagin, A., Metzger, M. (2011) From Encyclopaedia Britannica to Wikipedia, Information, Communication & Society, 14:3, p.355-374.

Giles (2005) Internet encyclopaedias go head to head. Nature, 438 p.900-901.

Google (2012) How Google search works [online] Available from http://www.google.com/competition/howgooglesearchworks.html [Accessed 31st May 2012].

Heilman JM, Kemmann E, Bonert M, Chatterjee A, Ragar B, Beards GM, Iberri DJ, Harvey M, Thomas B, Stomp W, Martone MF, Lodge DJ, Vondracek A, de Wolff JF, Liber C, Grover SC, Vickers TJ, Meskó B, Laurent MR, Wikipedia: A Key Tool for Global Public Health Promotion. Journal Medical Internet Research 2011;13(1):e14.

Highways Agency (2012) Highways Agency Future Delivery Programme [online] Available from http://www.highways.gov.uk/roads/29356.aspx [Accessed 13th July 2012].

Huvila, I. (2010) Where does the information come from? Information source use patterns in Wikipedia, Information Research, 15(3) paper 433.

Institute of Civil Engineers (2012a) ICE IS Panel January 2012 meeting minutes. London: Institute of Civil Engineers. Available from www.ice.org.uk/.../topics/.../IS-Panel-Minutes-17-Jan-2012.doc.aspx [Accessed 29th August 2012].

Institute of Civil Engineers (2012b) ICE IS Panel March 2012 meeting minutes. London: Institute of Civil Engineers. Available from www.ice.org.uk/.../topics/.../ISP-Minutes-20-March-2012.doc.aspx [Accessed 29th August 2012].

Institute of Civil Engineers (2012c) ICE IS Panel June 2012 meeting minutes. London: Institute of Civil Engineers. Available from www.ice.org.uk/.../topics/.../IS.../ISP-Minutes-13-June-2012.doc.asp [Accessed 29th August 2012].

Intelligent Positioning (2012) Wikipedia: Page one of Google UK for 99% of searches [online] Available from http://www.intelligentpositioning.com/blog/2012/02/wikipedia-page-one-of-google-uk-for-99-of-searches/ [Accessed 31st May 2012].

Kittur, A. And Kraut, R (2008) Harnessing the wisdom of crowds in Wikipedia: quality through coordination. In CSW08: Proceedings of the ACM 2008 conference on Computer supported collaborative work. New York: ACM Press.

Klobas, J. (2006) Wikis: Tools for information work and collaboration. Oxford: Chandos Publishing.

Kummervold PE, Chronaki CE, Lausen B, Prokosch HU, Rasmussen J, Santana S, Staniszewski A, Wangberg SC (2008) eHealth Trends in Europe 2005-2007: A Population-Based Survey, Journal Medical Internet Research 2008;10(4):e42.

Kuznetsov, S. (2006) Motivations of contributions to Wikipedia, Computers and Society, 36(2).

Laurent, M., Vickers, T. (2009) Seeking health information online: Does Wikipedia matter? Journal of American Medical Informatics Association 16(4): p.471-479.

Lih, A. (2004). Wikipedia as participatory journalism: reliable sources? Metrics for evaluating collaborative media as a news resource. Paper presented at the 5th International Symposium on Online Journalism (April 16-17, 2004), University of Texas at Austin.

Nature (2005) Wiki's wild world, Nature, 438(7070) p.890.

Network Rail (2012a) Improving the railway [online] Available from http://www.networkrail.co.uk/aspx/6306.aspx [Accessed 13th July 2012].

Network Rail (2012b) High speed rail development [online] Available from http://www.networkrail.co.uk/highspeedrail/ [Accessed 13th July 2012].

Network Rail (2012c) Electrification [online] Available from http://www.networkrail.co.uk/aspx/12273.aspx [Accessed 13th July 2012].

Network Rail (2012d) Building better stations [online] Available from http://www.networkrail.co.uk/aspx/6220.aspx [Accessed 13th July 2012].

SEOBook (2007) When will Wikipedia rank for everything? [online] Available from http://www.seobook.com/other-side-high-wikipedia-rankings [Accessed 31st May 2012].

Spoerri, A. (2007) What is popular on Wikipedia and why? First Monday, 12(4).

Stein, K. & Hess, C. (2007). Does it matter who contributes: a study on featured articles in the German Wikipedia. In Proceedings of the 18th Conference on Hypertext and Hypermedia, Manchester, UK, September 10 - 12, 2007, (pp. 171–174). New York, NY: ACM.

Trivers, R. (1971) The evolution of reciprocal altruism, The Quarterly Review of Biology, 46.

VTPI (2011) Online TDM Encyclopedia [online] Available from: http://www.vtpi.org/tdm/ [Accessed 20th August 2012].

Wikimedia (2012a) Wikipedia Statistics [online] Available from: http://stats.wikimedia.org/EN/TablesCurrentStatusVerbose.htm [Accessed 29th May 2012].

Wikimedia (2012b) GLAM [online] Available from: http://outreach.wikimedia.org/wiki/GLAM [Accessed 29th August 2012].

Wikimediafoundation (2012) Home [online] Available from http://wikimediafoundation.org/wiki/Home [Accessed 30th August 2012].

Wikipedia (2012a) Nupedia [online] Available from: http://en.wikipedia.org/wiki/Nupedia [Accessed 29th May 2012].

Wikipedia (2012b) Attribution [online] Available from: http://en.wikipedia.org/wiki/Wikipedia:Attribution#Citing_yourself [Accessed 29th August 2012].

Wilkinson, D. And Huberman, B. (2007) Assessing the value of cooperation in Wikipedia, First Monday, 12(4).

Willinksy, J. (2007) What open access research can do for Wikipedia, First Monday, 12(3).