

# On the trams

## Women, men and urban public transport in Germany

**Barbara Schmucki** Institute of Railway Studies, York  
Technical University, Darmstadt

Trams have profoundly affected the lives of women as consumers of public transport, though they were for long excluded from the process of providing tramway services. Male entrepreneurs and/or planners and drivers predominated and until recently transport history and the history of technology focused on this 'male' side of the transport business. However, rapid progress in gender history has changed the focus of historical research in general and led to new avenues of enquiry in the history of technology. It has become impossible to understand technology and technological change in terms of its traditional narrow definition as male-dominated territory. And a new consensus urges us to study not only the production but also the consumption of technology.<sup>1</sup> This article supports that approach. Looking at electric tramways and their passengers from 1881 to 1990, it studies the impact of gender on both the supply and the demand sides of public transport in Germany.

Historical research in general and on women in particular has concentrated mainly on the industrial workplace<sup>2</sup> as a production area or on the home<sup>3</sup> as a site of consumption. The dichotomy between the 'public' and the 'private' was the ideal of the bourgeois society of the nineteenth century, and it has guided historical research into gender relations. Recently scholars have started to insist on re-examining such dichotomies. In fact, a closer look makes it clear that we ought to differentiate the traditional ascription men = work = public and women = non-work = private.<sup>4</sup> The analysis of tramway history goes a step further by overcoming these dichotomies and showing their inadequacy for the study of gender relations. Tramways as new technology offered a new form of space within the city which was neither fully public nor wholly private. For the brief duration of the journey women and men alike were confined together within a narrow, intimate space. Trams constitute an almost unique opportunity to analyse how 'gender' was constructed in an interrelated process of 'male' and 'female' behaviour and experience.

In the recent past it has become obvious that space is heavily involved in shaping society in general and particularly in constructing gender relations. Women's experience of walking around is different from that of men. Their behaviour is more often influenced by an area's unsavoury reputation.<sup>5</sup> Different gender identities are strongly shaped by different places and the

different experience of space in them. The tramcar is one place which enables us to study the interrelations of urban space, transport technology and the formation of gender identities.

The first part of the article deals with the users of public transport. It emphasises the travelling habits of women and men. Questions are raised about the noticeable differences in the way women and men experience travel and I try to explain the origins of these gendered differences. The second part turns to the providers of public transport, focusing in particular on tram drivers. Although this occupation used to be a traditionally male one, with a strong masculine identity, women have begun to occupy the driving seat. The third and last part is about the planners of public transport. These people, mainly men, have played a crucial role creating the transport structures which have often shaped the differences between women's and men's experience of travel.

### Travelling

Gender differences in travelling by tram were already very visible in the nineteenth century. Male passengers would often jump on or off the vehicle while it was still moving. Women in their long, wide skirts were unable to do so easily, least of all when the tram was still in motion.<sup>6</sup> On the contrary, they had to be helped by the conductor up on to or off the high end-platform at stops. The Munich tramway company remarked in 1891, 'jumping on and off the moving vehicle is unquestionably accompanied by an element of risk, but it is the routine practice of male and younger passengers or those whose agility allows it'.<sup>7</sup> There was a major debate about this safety problem from the mid-1880s onwards. A survey of German cities (Berlin, Dresden, Frankfurt a.M, Hamburg, Leipzig and Munich) from 1889 revealed that every tramway company was engaged in a campaign against the habit. Public transport companies issued safety regulations outlawing the dangerous practice. Hamburg and Leipzig, for example, tried to restrict attempts to board a moving tramcar to the nearside rear entrance.<sup>8</sup> The Munich police department tried to follow up this regulation in 1891 with the additional proviso that people should be allowed to get on and off only at proper stops. But the tramway company rejected the idea.<sup>9</sup> The management tried to find a technical solution, such as making the entrances wider and fitting grab handles outside the car to make mishaps less likely.

This particular habit was not inevitably connected with a certain technology. It had been a problem in horse-drawn days, but electrification in the late 1890s brought no improvement in the situation. Complaints about reckless young men and accidents did not cease in the inter-war period despite regulations forbidding the practice after 1900.<sup>10</sup> Not until the mid-1950s did the habit of jumping on or off a moving tram come to an end when the older models were replaced by a new generation of cars with hydraulically operated doors and enclosed platforms. Nevertheless in 1950 the transport services of Dresden were still complaining about young men joyriding on the trams.<sup>11</sup> Obviously,

such behaviour must be understood as part of an intra-male construction of masculinity. Jumping on and off trams was a display of masculinity. From a transport historian's point of view, it is noteworthy that even such everyday technology as the design of tramcars was affected by the construction of gender identity.

A second way of examining gender in relation to tramways is through passenger analysis. Early twentieth-century statistical data show that in Munich between twice as many and four times as many men as women travelled by tram. Interestingly, the local police produced these statistics as a consequence of accidents on and around the trams. They questioned every person on the car involved in an accident. Those injured were much more likely to be men than women. During 1912 seventy-eight people were injured in accidents, only seventeen of them women. The statistical data reveal not only the number of passengers but also their occupations. The figures reveal that only a few passengers were workmen. Most belonged to the middle class, for example postmen, tradesmen or civil servants. Even members of the upper class such as an industrialist (*Fabrikant*), a judge and the wife of a man of private means were found travelling by tram.<sup>12</sup> Obviously public transport was not meant for the mass of working people until the inter-war period. At the turn of the century a flyer put out by Social Democratic Party activists in Munich showed how tramways could benefit that sector of the public: 'Public health experts are also in favour of the measure [to keep fares cheap], so that people with limited incomes can at least enjoy some fresh air beyond the dust of the city for an hour or two on Sundays and holidays.'<sup>13</sup>

Before the First World War public opinion regarded trams as far less convenient for women than for men. A newspaper article of 1897 said:

While the leading physiologists and psychologists may say that the masculine sex and the feminine sex have the same brain power, a tram conductor will never acknowledge it. The gentler sex, with its nervous haste in boarding or getting off a tram, its forgetfulness and its lesser regard for the value of time, will make double the work for the conductor.<sup>14</sup>

Whereas men formed the majority of passengers up to the First World War, the 1920s saw a more and more equal representation of women. In particular, the 'modern woman' of the Weimar era led to a change in the public image of women which also affected their use of public transport. With the introduction of the typewriter in the 1890s offices slowly became feminised in the early years of the twentieth century. There followed a considerable growth in the number of women working as clerks. Between 1907 and 1925 the number of female clerks tripled in Germany, and the trend continued into the mid-1930s.<sup>15</sup> In 1931 the professional association of female civil servants alone commanded a membership of 100,000 (mainly in the postal and telephone services).<sup>16</sup> The new office jobs in the cities meant that women became more visible in public about this time, although the overall percentage of women working did not rise very much. They were using public transport

not only for the journey to work but also for the new leisure activities that were opening up, such as going to the cinema or shopping.

The 1950s marked another change in the gendered use of trams. During the early years of the Motor Age men were the first to take to cars. Contemporary transport experts declared that 'even though in future fathers may all drive to work in their own cars, public transport remains crucial for their wives who have to do the shopping and for the older children in getting to secondary school'.<sup>17</sup> In 1976 a survey revealed that in the Ruhr women aged between twenty and fifty-nine used the different modes of transport in the following proportions: 30 per cent drove a car, 11 per cent were front-seat passengers and 59 per cent went by public transport, by bicycle or on foot. It is clear that men drove more (60 per cent), were less often car passengers (4 per cent) and did not frequent public transport (36 per cent). In 1992 the gender ratio was still intact but had shifted considerably towards greater car use (women 43 per cent, men 69 per cent).<sup>18</sup> By this time public transport in general and trams in particular had gradually become a social service to allow mobility to fringe groups in society, among whom women were numbered. The late 1970s and early 1980s saw the first scientific investigations of differences in the mobility patterns of men and women. The severely polluted and traffic-congested state of the cities meant that specialists became aware of the need to understand the mobility patterns of city dwellers if they were to improve traffic movement and the quality of urban life. Passengers and road users were no longer an unknown quantity. The new investigations showed that there were big differences between men and women, elderly people and children, the working population and those not working. In 1974 ('Infas Erhebung') it became clear that 77 per cent of men and only 35 per cent of women held a driving licence.<sup>19</sup> The remainder of the population relied on public transport.

But it was not just a question of access to means of transport. Women adopted different patterns of travel for reasons of personal safety. Since transport planners and local governments were blissfully unaware of this issue until the 1980s, historians have had to use considerable imagination to locate sources for earlier years. Some indication of relations between passengers and the conductors is to be found in the records of disciplinary procedures for tramway personnel. But a surprisingly small number of incidents involved relations with passengers. In Munich between 1919 and 1933 two conductors were dismissed for assaulting women, one for pushing a women's knee down (she was sitting with her legs crossed) and one for a sexual offence.<sup>20</sup> From the evidence available, it is likely that male conductors more often assisted than threatened women passengers' safety in the public realm. As employees of the company they had to follow a code of behaviour which embraced not only the official regulations but also general social relations between men and women. In this sense the tramcar functioned as a protected and highly controlled public space where social behaviour and codes were implemented.

Little research has been done as yet on the history of public transport in Germany under Allied and Soviet occupation between 1945 and 1948. In

periods of crisis traditional social codes often cease to be effective. According to the director of the tramway company in Dresden in 1945, because of extended service hours:

Our female conductors have to work longer in the evenings and for that reason are more exposed to danger. Both they and female passengers have been threatened with guns on the trams. Recently a woman passenger was dragged from the car and away into the darkness. A female conductor was threatened with a gun and dragged to an apartment, where she was raped. After finally being released at 1.30 at night, she encountered a group of soldiers and was again raped three times.<sup>21</sup>

Attacks like these were not uncommon at the time in German cities. Such incidents, which until recently have received scant attention, must be understood in the context of female experiences in occupied Germany. It is important to note, however, that the general power relationship between men and women affects the working conditions of female conductors and the experiences of passengers in the worst possible way at times of crisis. In Munich a woman conductor reported in 1947, 'While on duty I had to put up with Americans wiping their boots on my uniform.'<sup>22</sup> And in August 1947 there were seven cases of drunken Americans molesting women passengers by tearing them from their seats.<sup>23</sup> Such evidence suggests that the Second World War was not only a time of systematic destruction of transport networks through bombing but also a period in which the gendered nature of transport can be studied very well.

In the 1980s, as more and more people travelled by car, it became obvious that public transport remained the principal means of transport for women and was still not safe for them. It was not just the ghastly silence ('unheimliche Stille') that inspired fear. Badly designed stations and empty trams or Underground carriages seemed to invite violence, homeless persons and alcoholics. Although no rise in the crime figures was evident from police records, women increasingly avoided public transport, especially in the evenings.<sup>24</sup> Some companies tried to set up taxi services for women passengers at night<sup>25</sup> and began to improve their security arrangements. From 1974 to 1983 there was a special police force in Munich, the so-called 'black sheriffs', to improve security on the Underground. They were not well received by the public, and rumours suggested that they were themselves not unknown to harass lone female passengers. In 1989 the local government changed the policy and installed the U-Bahn-Wache (Underground police force) in a bid to improve security on public transport. Officially part of the Munich local government, the new force enjoyed a better reputation and seemed more trustworthy and generally friendlier. At the same time, station design was improved to include better lighting and fewer hiding places for potential criminals and rapists.<sup>26</sup> Security statistics in fact show a considerable decline in minor offences, down roughly 50–70 per cent by the end of the year.<sup>27</sup>

Public transport is a place where the interaction of technology and society can be analysed. It is the technology that produces a 'semi-public space'

where social behaviour is determined and controlled. Furthermore – as the topic of security showed – technology is not gender-neutral. The tramway as a technological artefact was not the same thing either for female and male passengers or for male and female drivers. It supported the hierarchical ordering of gender differences. But eventually awareness of that interrelation led to a social shaping of technology and technological change.

## Working

Traditionally men dominated the supply side of urban public transport. They planned the systems, ran the enterprises and drove the vehicles. In fact, transport technology was, and to a degree still is, a male dominion.<sup>28</sup> While women drivers are now a familiar sight in towns the admission of women to a men's world has been only gradual. Certainly women have always been an important part of the work force in Germany, not least in transport enterprises. Up to the First World War, however, they were segregated, employed merely as track cleaners, 'pointsmen' for basic signalling or as general cleaners.<sup>29</sup>

As in many other fields, the First World War was the point of entry to men's jobs, given the wartime shortage of drivers and conductors. In this situation public transport undertakings (e.g. in Berlin, Bremen, Hamburg, Munich, etc.) for the first time hired women for the more responsible positions of driver and conductor. But as conducting, let alone driving, was not generally seen as suitable work for females, they were dismissed when the war was over. Not all the companies lost interest in female staff, however, and aptitude tests were introduced for women. In the 1910s and 1920s it was quite common to run such tests on men, because at the time psychology was emerging as a novel science with a great interest in promoting these tests. Scientists – and there was not a woman among them – striving to establish themselves, came up with new so-called psychotechnical methods of testing suitability for jobs.<sup>30</sup>

Analyses of these psychotechnical tests show how differences between men and women were constructed. The stated differences did not emerge from scientific tests, as no measurable biological differences could be shown between women and men regarding the jobs in question. On the contrary, tests produced socially shaped perceptions of women and men. The main indicator of aptitude for driving was reaction time. It was tested on a machine where the subject had to press a button as soon as he or she saw a point of light on a screen. Not surprisingly, a test from 1920 detected no significant difference between men and women, if anything the women's results were better.<sup>31</sup> Yet scientists spoke of remarkable differences. On the one hand they emphasised the influence of menstruation on attention and reaction. The assertion was unsupported by evidence: the researchers asked for more funds to conduct further studies. On the other they claimed remarkable 'psychological' differences in the behaviour of women observed in the context of the test. Men, it was argued, were generally more interested and more attentive. Women were nervous about the technical apparatus and were said to behave

childishly and foolishly. The researchers underlined these results with the so-called 'experiences' of women drivers during the war, suggesting that women were too weak to work the brake handle with one hand.<sup>32</sup> In fact, technical ineptitude was seen as the decisive argument against women as drivers:

While every man wants to understand the connection between levers, buttons and the function of the machine, women could not care less. Later training about technical details reveals far less mechanical and technical understanding among the women. ... While driving, women miss the quiet way of working which is characteristic of the good driver. Often they start driving away, and then brake sharply and too late. ... Unexpected street hazards lead to loud screams, while a sudden helplessness descends, and all the requisite gear changes, however familiar, are forgotten or at least not done properly.<sup>33</sup>

Other objections raised to the employment of female drivers were a diagnosed lack of natural authority and the inclination of women to chat rather than work:

It seems to be an ordeal for women drivers to work silently. They prefer to start talking to passengers, but if there happens to be a woman colleague on the car they are chatting away all the time. They listen in to passengers' conversations, and all too easily the woman driver is tempted to join in when the talk is no business of hers, or at least to turn round and see who is speaking.<sup>34</sup>

This research led to the conclusion that women were not suitable for driving jobs at all. In 1940 a new law even banned women drivers altogether, which is interesting because again a wartime shortage of men had led the transport concerns to consider women for the job.<sup>35</sup> In fact not long after the law was passed women were again to be seen driving trams and buses, having been given special permission owing to the acute shortage of men. Interestingly private truck driving was never forbidden. Meanwhile conducting slowly became a female job, even though conductresses had to cope with the same technology as drivers. They not only had to sell and check tickets but were also responsible for technical matters like braking (each end of the car had its own brake handle), reversing and controlling the doors. They also had to replace the trolley pole when it escaped from the overhead wire. Even experienced conductresses who had had to quit at the end of the First World War were retrained in the late 1930s and, unlike the women drivers, were allowed to stay on after the Second.<sup>36</sup> The exigencies of wartime led to many women being taken on a second time as drivers and conductresses as men were called up for military service.

In the mid-1950s there was another shortage of drivers, because men were attracted to better paid jobs in industry, which was experiencing a boom. This time it was not a temporary phenomenon. In fact it was the start of permanent appointments of women drivers in Germany. Public transport undertakings now sought special permission for conductresses to be allowed to learn to drive, leading to a revival of the debate about aptitude. Once more

the female body and psyche were being tested. In contrast to the First World War, the experience with women drivers in the Second was adjudged a success.<sup>37</sup> By now technological developments had lightened the physical demands of the job, and this was seen as crucial in enabling women to drive public service vehicles.<sup>38</sup> But the Ministry of Labour and Social Affairs (Arbeits- und Sozialministerium), the Union of Civil Servants (Gewerkschaft öffentlicher Dienst, Transport und Verkehr, ÖTV) and exponents of occupational health had reservations. They voiced the old concern that women were physically and mentally unsuited to drive trams and buses. Local authorities and transport undertakings had to overcome considerable resistance before the first women drivers were employed, in Duisburg, in 1960. Munich followed in 1965 after protracted debate. Newspapers were keenly interested in the new drivers and printed photographs of attractive women, stressing the femininity they retained even at the controls of a tramcar. They headlined 'Ladies at the wheel' and 'Steering with a gentle touch'.<sup>39</sup>

By the 1970s the gender debate had changed completely. The difference between the sexes was now all in favour of the women:

Men want variety, at times they are skyrocketing in their desire to move on. Women prefer to preserve the given. And this may very well constitute good grounds for the appointment of women drivers. ... Women may be more suited to the defensive way of driving popular nowadays and thus may be ideal to meet today's call for safety in driving.<sup>40</sup>

In 1972 women were at long last legally permitted to drive.<sup>41</sup> But new laws did not bring major change. By the end of the 1980s only 6 per cent of drivers on German public transport were women.<sup>42</sup> The figure bears international comparison. For instance, in Britain transport officials in Nottingham mentioned a ratio of one woman to forty men bus drivers in 1984.<sup>43</sup> Apparently the dominance of a masculine occupational environment that excluded women in the past continues to do so to a certain extent today. In this context, masculinity implies various socially shaped factors. Firstly the male body was automatically associated with greater physical strength and therefore better suited to the rigours of driving a heavy vehicle. But it was not only the hypothetical physical strength that mattered, as the male physique also implied better mental readiness. Men were built to handle 'big technology' such as streetcars.

Secondly the male occupational identity was supported by male behavioural patterns and service regulations. At first the performance of drivers was regulated by a military-style code of conduct. It was not only military 'fitness' that enabled men to drive: in 1901 military salutes and a military code of conduct were part of the conditions of employment in public transport in Germany. Uniform was compulsory. In fact during the nineteenth century public transport uniforms were modelled on army uniform.<sup>44</sup> After the Second World War the rules on dress were much more relaxed. On warm days drivers were allowed to take off their jacket and cap. In 1975 there was

a complete break with tradition as new uniforms were introduced which no longer harked back to the militarism of the past.

Yet for women the association was never strong. During World War I conductresses were issued with uniforms for the first time. Interestingly, the result was considered more amusing than impressive: neither proudly military nor feminine in appearance.<sup>45</sup> This situation changed under the Nazi regime. Indeed, in the 1930s 'The leaders of the Third Reich sanctioned much better uniforms for women. Deep blue waisted jackets went along with matching small caps that sat smartly on the hairstyle. Both suggested nice figures that encouraged musicians to write popular songs about them.'<sup>46</sup> Up to the 1970s uniforms reflected the female shape and accentuated 'femininity'. This led to a different role and appearance in public compared with men. Because of this peculiar dress code women exerted less authority.

### Planning

Finally this article briefly reflects upon the implications of the gendered structure of the planning professions. A German analysis of transport undertakings, traffic sciences, planners, transport authorities, unions, associations and corporations showed, in 1987, that only 1.3 per cent of senior positions were held by women.<sup>47</sup> Women were severely underrepresented in the decision making of urban transport systems and have remained so to the present. Prior to the 1950s planning did not discuss gender-specific needs. It dealt only with street capacities, extensions of public transport and managing traffic flows. Passengers, drivers, cyclists or pedestrians were no more than asexual statistics. From the 1950s, however, transport planners began to recognise women's needs. The main concern was women as housewives and their anticipated requirement for shopping facilities: 'Generally, the construction of new residential areas has to pay more attention to the fact that women want to do the shopping in their own neighbourhood.'<sup>48</sup>

The reality of transport systems, however, disclosed another pattern. The gendered composition of the planning profession led to a preference for transport structures suited to middle-class men in cars, because the planners themselves belonged to that social group. Their 'windscreen outlook' or 'windscreen view' was responsible for street planning focused on private cars used mainly by male commuters. Public transport systems also fitted in this scheme. In the 1960s and 1970s they were designed to facilitate the journey to work, preferably by Underground. They were meant not only to speed the journey from the (middle-class) suburban housing areas to the place of work in the city centre but also to clear the streets of trams and make more room for cars. Such planning, obviously, neglected the fact that non-working women especially could have a different experience of and different need for public transport.<sup>49</sup>

Only when women themselves became planners or architects in the 1980s was there a shift towards recognising mobility patterns other than those of commuting men. This trend was not merely a German but an international

development. In the United States and the United Kingdom too the 1980s saw the publication of the first studies of women and transport. They revealed interesting similarities in female mobility patterns around the (industrial) world.<sup>50</sup> But the arrival of women as planners has not brought homogeneity. A recent critical study of the gendered nature of planning in Germany still points out major differences in planning attitudes between women and men: 'while women base their plans on local needs and relations between people, men base their plans on vast buildings and acres of impressive space. Transport planning, dominated largely by men, also demonstrates this telling dominance of large-scale thought.'<sup>51</sup>

## Conclusion

The analysis of gender relations in urban public transport, especially in relation to tramways, in Germany since 1881 has provided a useful means of combining the theoretical approach of the 'production-consumption function' and overcoming the concept of gender dichotomies. Further, it has opened up a new perspective on the impact of space in forming gender identities and shaping gender relations. Last but not least it has revealed the influence of an everyday technology on the construction of gender.

It is important to understand that women and men have different patterns of travel. Around 1900 tramways were used mainly by men. That was to change between the wars, when more and more women used them. The advent of mass car ownership in the 1950s has left women more dependent on deteriorating public transport while men have taken to their cars. Further, the differences between the travel patterns of women and men can be explained by the 'transported body'. The human body has to establish a special relationship with transport technology. In a sense, it has to fuse with transport technology, producing a new physical sensation of movement.<sup>52</sup> Female and male bodies were shaped differently by role expectations at the time (on or around the tramcars, etc.). For instance, it was recognised as no easy matter for women in skirts to jump on or off a tram. Women have also become more vulnerable on public transport, particularly when alone in times of upheaval, as the immediate post-war period demonstrated.

Historically, women have been scarcely visible among the work force of urban public transport. The lack of women tram drivers can be explained by the fact that the occupation was strongly linked with and formed by male identity and ideology. Women were not regarded as physically or mentally capable of handling such heavy vehicles. 'Big technology' was only for men. Women were thus admitted to the job only temporarily in times of manpower scarcity. The gender construction of the occupation was so strong and persistent that it has hindered women from driving trams and buses to the present day.

Public transport systems in cities have always been a part of the public sphere. As such they have often been considered 'masculine'. This research reveals, however, that certain spaces in the city such as the interior of a tramcar cannot

be assigned definitely to either the public or the private sphere. This outcome helps efforts to overcome the traditional dichotomy of public and private spheres that has often been taken for granted in historical research. Men and women were not segregated in these special spaces. From the passenger's point of view the tram was neither a workplace nor a household, it was a place where women and men met outside their 'traditional' spheres. Here it is possible to study the construction of gender differences. Urban public transport enforced differences between the sexes as a public service. Men and women behaved differently when taking the tram. Men had to offer a woman their seat, while women were forbidden the upper deck. After the Second World War public transport became a place of fear where women were the victims of sexual harassment and other forms of violence.

Transport planners, albeit often overlooked, were successful in constituting themselves as a group of experts. They were largely responsible for constructing the new public space and for the technology of vehicles and tracks. They were as much, maybe more, involved in producing transport technology as the public undertakings and private enterprises were. The outcomes of the planning process have clearly affected the demand side, passengers and their cultural behaviour. Up to the 1980s planning was almost exclusively by men to meet men's needs. The profession reinforced the gendered structure of modern mobility patterns and supported the gendering of transport without showing it.

## Notes

- 1 S. Lubar, 'Men/women/production/consumption', in R. Horowitz and A. P. Mohun (eds), *His and Hers: gender, consumption, and technology* (Charlottesville VA and London, 1998), p. 8.
- 2 R. Horowitz, "'Where men will not work': gender, power, space and the sexual division of labour in America's meat-packing industry, 1890–1990", *Technology and Culture* 38 (1997), pp. 187–213.
- 3 R. Schwartz Cowan, *More Work for Mother: the ironies of household technology from the open hearth to the microwave* (New York, 1983); J. Wajcman, *Feminism confronts Technology* (University Park PA, 1991), chapter 5.
- 4 N. Lerman, A. P. Mohun and R. Oldenziel, 'Versatile tools: gender analysis and the history of technology' and 'The shoulders we stand on and the view from here: historiography and directions for research', *Technology and Culture* 38 (1997), pp. 1–30, especially pp. 5 and 25.
- 5 See M. Imboden, F. Meister and D. Kurz (eds), *Stadt–Raum–Geschlecht. Beiträge zur Erforschung urbaner Lebensräume im 19. und 20. Jahrhundert* (Zürich, 2000); S. Hanson and G. Pratt, *Gender, Work and Space* (New York, 1995), especially pp. 16–9.
- 6 Half the accidents in 1912 (twenty-nine out of fifty-nine) were concerned with jumping on and off, nineteen caused by men, ten by women. Staatsarchiv München, Unfallstatistik der elektrischen Strassenbahnen anno 1912–1915, RA 62831.
- 7 Staatsarchiv München, Polizeidirektion München, Revision der ortspolizeilichen Vorschriften über den Betrieb der Pferdebahnen in München § 29, 1889, Pol. Dir. 993.
- 8 The first regulation in Munich was in 1886. Staatsarchiv München, Polizeidirektion München, 1891, Pol. Dir. 993.
- 9 Staatsarchiv München, Pol. Dir. 993. Ortspolizeiliche Vorschriften 1895, Staatsarchiv München, RA 62822.
- 10 Ortspolizeiliche Vorschriften der königlichen Polizeidirektion München für den Betrieb der elektrischen Strassenbahn in München 1906, § 33, Staatsarchiv München, RA 62832; E. A. Pfeiffer, *Unsere Elektrische. Zum 50 jährigen Jubiläum der elektrischen Straßenbahn* (Stuttgart, 1931).

- 11 1 July 1950, Stadtarchiv Dresden, Verkehrsbetriebe 171.
- 12 Staatsarchiv München, Unfallstatistik der elektrischen Strassenbahnen anno 1912–1915, RA 62831.
- 13 16 October 1904 Meldung Pol. Dir. an K.d.I., Flugblatt zur Ausrufung des Tramboykotts der SP, RA 62823.
- 14 ‘Münchner Spaziergänge’, *Augsburger Abendzeitung* 115 (1897), p. 5. Staatsarchiv München, Pol. Dir. 993.
- 15 U. Frevert, *Frauen-Geschichte* (Frankfurt a.M., 1986).
- 16 U. Nienhaus, “‘Neue Frauen’ im öffentlichen Dienst. Der Frauenverband der deutschen Post- und Telegraphenbeamtinnen 1905–1933”, *Internationale wissenschaftliche Korrespondenz zur Geschichte der deutschen Arbeiterbewegung* 34 (1998), pp. 426–40, especially p. 436.
- 17 R. Colberg, ‘Nahschnellbahnen und Stadtstruktur. Betrachtungen zum Münchner S-Bahn-Projekt’, *Internationales Archiv für Verkehrswesen* 9/10 (1958), p. 324.
- 18 Socialdata, *Trenduende zum ÖPNV. Basisbroschüre* (Munich, 1993), p. 22.
- 19 R. Menke, ‘Verkehrsplanung – für wen?’ *Bauwelt* 53 (1977), pp. 19–23.
- 20 Disziplinarverfahren 1919–1933, Staatsarchiv München, RA 62833.
- 21 Dresdner Strassenbahn AG to Bürgermeister Welz, 18 December 1945, Stadtarchiv Dresden, Rat der Stadt, Dez. Technik 26.
- 22 Jahresbericht für das Wirtschaftsjahr 1948/49, Stadtarchiv München, Verkehrsbetriebe, Aktenabgabe 67/3, 298.
- 23 Nötigung des Fahrpersonals durch Angehörige der US-Armee, 3 September 1947, Stadtarchiv Dresden, VB 171.
- 24 Eberhard Geiger, newspaper article, June 1979, Archiv Freunde Münchner Trambahn Museum, Munich.
- 25 There was a one-year trial of a tram taxi service after 9.00 p.m. *Süddeutsche Zeitung*, 27 February 1989, Archiv Freunde Münchner Trambahn Museum, Munich.
- 26 C. Jeschke, *Die Sicherheit von Frauen als allgemeine Mobilitätsbedingung*, Schriftenreihe des Instituts für Verkehrsplanung und Verkehrswegebau 25 (Berlin, 1993)
- 27 *Süddeutsche Zeitung*, September 1989, Archiv Freunde Münchner Trambahn Museum, Munich.
- 28 Wajcman, *Feminism confronts Technology*, chapter 6.
- 29 Dienstvorschriften 1912, Staatsarchiv München, Disziplinarverfahren 1908–1913, RA 62832.
- 30 Münsterberg first tested drivers in 1912. H. Münsterberg, *Psychologie und Wirtschaftsleben. Ein Beitrag zur angewandten Experimental-Psychologie* (Leipzig, 1912), pp. 44–6. Criticism of Münsterberg: Piorkowski, *Beitrag zur psychologischen Methodologie der wirtschaftlichen Berufseignung*, Beiheft zur Zeitschrift für angewandte Psychologie 11 (Leipzig, 1915), pp. 20–2.
- 31 Thirty-six men and thirty-one women were tested. A. Schackwitz, *Über psychologische Berufs-Eignungsprüfung für Verkehrsberufe. Eine Begutachtung ihres theoretischen und praktischen Wertes erläutert durch eine Untersuchung von Straßenbahnführern* (Berlin, 1920), p. 170.
- 32 *Ibid.*, p. 172.
- 33 *Ibid.*, p. 173.
- 34 *Ibid.*, p. 174.
- 35 Anordnung über die Beschäftigung von Frauen auf Fahrzeugen des Reichsarbeitsministeriums, 30 October 1940.
- 36 *Völkischer Beobachter*, 25 September 1939, Archiv Freunde Münchner Trambahn Museum, Munich; R. Schanter, ‘Der feste Schaffnerstand und seine Vorbedingungen’, *Verkehr und Technik* 9 (1949), p. 191.
- 37 H. Fehleemann, ‘Erfahrungen mit dem Einsatz von Frauen und Ausländern als Straßenbahnfahrer’ in *Attraktivität und Wirtschaftlichkeit im öffentlichen Personennahverkehr*, Schriftenreihe für Verkehr und Technik 18 (Bielefeld, 1963), pp. 29–35.
- 38 W. Traenkle, ‘Frauen im Fahrerndienst’, *Verkehr und Technik* 1 (1965), pp. 3–6; Pressemitteilung Stadtwerke Frankfurt, 13 June 1972, p. 4.
- 39 ‘Dame am Trambahnsteuer’, *Nürnberger Nachrichten*, 13 January 1965; ‘Von zarter Hand gesteuert’, *Nürnberger Zeitung*, 14 January 1965, Archiv Freunde Münchner Trambahn Museum, Munich.
- 40 Rundschreiben des Verbandes öffentlicher Verkehrsbetriebe (VÖV), *Frauen dürfen Strassenbahn, Busse und U-Bahnzüge führen*, Cologne, 19 January 1972.

- 41 Verordnung über die Beschäftigung von Frauen auf Fahrzeugen, 1 January 1972.
- 42 H. Minssen, *Arbeit und Technik im Fahrerdienst von öffentlichen Verkehrsunternehmen. Zwischenergebnisse aus einem Forschungsprojekt*, Beiträge aus der Forschung 26 (Dortmund, 1988), p. 5.
- 43 Women and Transport Forum, 'Women on the move: how public is public transport?' in Cheris Kramarae (ed.), *Technology and Women's Voices: keeping in touch* (New York, 1988), pp. 126–7.
- 44 H. Mattiesen, 'Geschichte der Tarife, Fahrscheine und Uniformen', in *100 Jahre Münchner Strassenbahn 1876–1976. Vom Groschenwagen zur U-Bahn* (Munich, 1976), p. 434.
- 45 There is a photo in *ibid.*, p. 436.
- 46 *Ibid.*, p. 285.
- 47 Münchner Forum, *Frauen und Stadtplanung – so geht's nicht weiter! Frauen verändern ihre Stadt – Bestandesaufnahme – Analysen – Konzepte – Umsetzung*, conference proceedings, Berichte und Protokolle 90 (Munich, 1988); I. Clement and U. Lichtenthäler, 'Frauen als Verkehrsplaner(innen)', *RaumPlanung* 39 (1987), pp. 185–7.
- 48 L. Jänecke, *Verkehr im Städtebau* (Bielefeld, 1954), pp. 95–6.
- 49 B. Schmucki, 'Cities as traffic machines: transport and the city after World War II', in Colin Divall (ed.), *Suburbanising the Masses: public transport and urban development in historical perspective* (forthcoming, 2002); B. Schmucki, *Der Traum vom Verkehrsfluss. Städtische Verkehrsplanung seit 1945 im deutsch-deutschen Vergleich*, Beiträge zur historischen Verkehrsforschung 4 (Frankfurt a.M., 2001).
- 50 G. Giuliano, 'Getting there: women and transportation', in J. Zimmerman (ed.), *The Technological Woman: interfacing with tomorrow* (New York, 1983), pp. 102–12; Lichtenthäler and Clement, 'Frauen als Verkehrsplaner(innen)', pp. 185–7; Women and Transport Forum, 'Women on the move', pp. 116–34.
- 51 S. Michel, 'Weibliche Werte, unters Rad gekommen. Verkehrsplanung: Die heutige Ausbildung schreckt Frauen davon ab, in diese Männerdomäne einzudringen', *Weltwoche*, 21 (1996), 23 May, p. 49.
- 52 Barbara Schmucki, 'Cyborgs unterwegs? Verkehrstechnik und individuelle Mobilität seit dem 19. Jahrhundert', *Technik und Gesellschaft* 10 (1999), pp. 87–119.

### Acknowledgements

I want to thank three anonymous referees of this journal for their helpful comments and especially Flurin Condrau for stimulating suggestions and for looking after my English.

### Address for correspondence

Institute of Railway Studies, National Railway Museum, Leeman Road, York YO26 4XJ. E-mail bs16@york.ac.uk