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*Original Article*

# Stratification and Work in Contemporary Logistics

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## Abstract

This paper examines the relationship between stratification and work in contemporary logistics from two theoretical angles. The first involves an analysis of the utility of the model of primary versus secondary labour markets as a template for assessing the core characteristics of logistics' work. The second involves a parallel assessment of the salience of post-modern theories of time for an understanding of how such work is structured. Logistics involves the movement of goods and information by road, rail, sea and air. High levels of surveillance and control are embedded within these flows. These are critical for the creation of value via the supply of commodities to industrial, personal and commercial customers at the exact time desired by them. This has involved a paradigmatic shift in economic production from the Fordist system, whereby goods were manufactured in long production runs and then pushed up the supply chain to retailers, to a post-Fordist system, whereby production is determined directly by consumer demand. The world of transportation and warehousing has suffered from systematic neglect by sociologists. Part of this lies in a deep seated Marxist bias within the field whereby factory work is characterized as "productive" and somehow more significant and authentic, whereas the worlds of transportation and distribution are seen as "unproductive" and far less important.

## Keywords

Logistics • Employment • Work • Labour markets • Post-modernism • Time • Economic sociology

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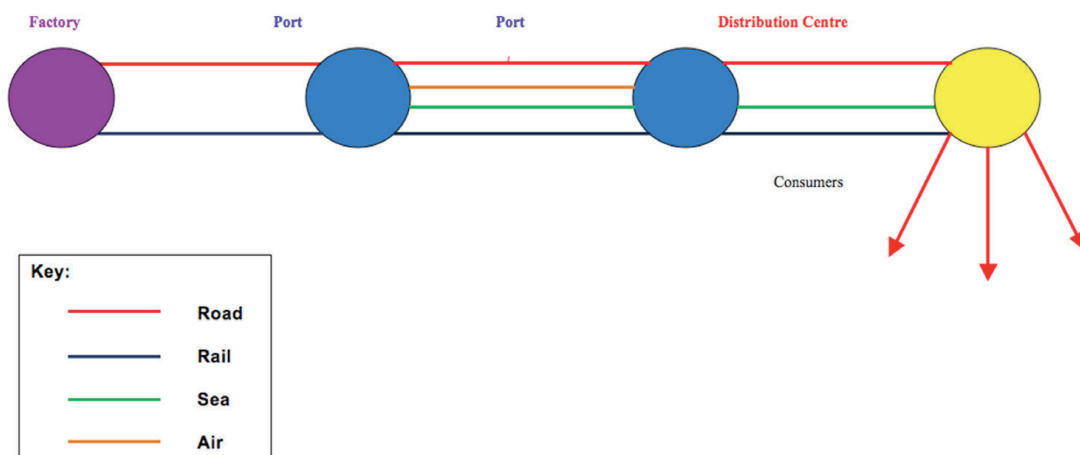
This paper examines the relationship between stratification and work in contemporary logistics. This will be examined from two theoretical angles. The first will involve an analysis of the utility of the model of primary versus secondary labour markets as a template for capturing the core characteristics of such work. The second involves a parallel assessment of the salience of post-modern theories of time for an understanding of how such work is structured.

### What is Logistics?

Logistics refers to the systems of work that transport goods from their point of production to the point of consumption.<sup>2</sup> The point of production is normally a factory but the point of consumption can be either retail outlets or, increasingly as a result of internet purchases, a consumer’s personal address. The global logistical system involves a range of different modes of transportation as well as differing types of warehousing and intermediate distribution points (see Diagram A).<sup>3</sup>

The emergence of modern logistics has involved the incorporation of complex computerised information systems into the movement of commodities on a global scale. Logistics is centred upon the movement of goods and information by a range of means which include road<sup>4</sup>, rail, sea and air. High levels of surveillance and control are embedded within these flows. These are critical for the creation of value via the supply of commodities to industrial, personal and commercial customers at the exact time desired by them. This has involved a paradigmatic shift in economic production from the Fordist “push” system, whereby goods were manufactured in long production runs

Diagram A  
Global Logistics



2 Logistics can also refer to the wider cycle of production and distribution viewed as an integrated system. In this paper a narrower definition is used.  
 3 This is a simplified picture of a complex structure. One example of such additional complexity is the transport of containers by sea from feeder ports to the major international ports (see Liu, Wang, & Yip, 2013)  
 4 80% of transportation in the USA by value is by road (see Ross, 2004).

and then pushed up the supply chain to retailers, to a post-Fordist “pull” system, whereby production is determined directly by consumer preferences and demand. Walmart – the world’s largest retail company – is seen by many (see Featherstone, 2004; Lichtenstein, 2005) as the exemplar of this system of production and supply. The successful functioning of the logistics system is central to the delivery of profitability in contemporary global markets. Indeed, the basic unit of competition is now increasingly the supply chain itself.

One aspect of the increasing use of Japanese-style, just-in-time delivery systems designed to minimize stock inventory [buffers] by manufacturers has been the growth of enormous international logistics companies like *Excel*, *Fedex*, *UPS* and *DPWN*. Manufacturing firms increasingly seek to eliminate both incoming and outgoing inventories in various ways, including the use of sub-assemblies designed to facilitate snap-together assembly lines (the traditional motor car was assembled from over 10,000 separate components). Indeed, manufacturers increasingly build only in response to direct orders from customers (BTOs). These have produced a demand for custom-designed delivery systems that incorporate all forms of transport – by land, rail, air and sea. The internet has also been a powerful driver of the growth of logistics companies. The phenomenal rise of *Amazon* is testament to this. A large number of goods (apart from books) can be purchased on its site that originate from a wide range of international destinations. The logistics revolution involves a wide set of inter-related global changes. Flexible production is built upon containerization, intermodal transport and advanced warehousing<sup>5</sup> (see Cudahy, 2006; Levinson, 2006).

Industrial sociology has long had a fascination with factory production as the exemplar of modern work. Classical theorists such as Marx (1974 and 1976) and Weber (1968; 1981) both characterized industrial capitalism in terms of the centrality of industrial production. Subsequently, industrial sociologists saw factory production in general, and assembly-line production in particular, as the epitome of modern work (see, for example, Goldthorpe, Lockwood, Bechhofer, & Platt, 1969; Walker & Guest, 1952). This became embodied in notions of Fordism (see Durand & Boyer, 1997; Lipietz, 1992; Shiomi & Wada, 1995) within economic sociology.

This preoccupation with the factory worker has been challenged by a series of writers. Beynon (1992) argued that new hermeneutic models were necessary within economic sociology as a consequence of the rapid disappearance of manufacturing industry and the “industrial worker.” Penn and Sleightholme (1995) also problematized this fascination with assembly lines, especially those in car plants, in their analysis of car maintenance work. They showed that for every car production worker there were twenty employed in garages as car maintenance workers.

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<sup>5</sup> In 2002 warehouse space in the USA totalled around 3.4 billion square feet and the cost of warehousing was \$78 billion (see Ross, 2004).

The world of transportation and warehousing has suffered from systematic neglect by economic sociologists (Bonacich & Wilson, 2008, represent the main exception). Part of this lies in a deep seated Marxist bias within the field. Factory work is characterized as “productive” and somehow more significant and authentic, whereas the worlds of transportation and distribution are seen as ‘unproductive’ and far less important.

Such assumptions make little or no economic or sociological sense. Currently a pair of jeans made in China can be transported to a warehouse in the USA or Western Europe for around 30p. This is the result of the enormous economies of scale now evident in the global logistics system and the integration of production and circulation into global patterns of economic activity (see George, 2013). To ignore such work leaves economic sociology in a state of increasing marginality and ultimately irrelevance.

### **The Characteristics of the Primary and Secondary Labour Market**

There has been a longstanding debate about the nature of contemporary work in terms of dualistic models of the labour market. This paper presents a simplified model of primary and secondary labour markets (see Model A) as a *heuristic device* for the analysis of the empirical materials collated during recent fieldwork into logistics’ work in the USA and Britain. These two polar models should be seen as “ideal types:” they are designed to assist in the interpretation of the fieldwork data.

The primary labour market is characterised by relatively high wages, stable, permanent, full-time jobs and secure employment (see Doeringer & Piore, 1971; Edwards et al., 1975). Workers enjoy good working conditions, are protected by trade unions, can acquire skills on the job itself and are part of extensive career ladders (see Rubery & Wilkinson, 1994). Jobs in the primary labour market are generally undertaken by men – although this has changed somewhat over the last 30 years (see Berridge, Penn, & Ganjali, 2009). These men in the primary labour market originate overwhelmingly from the dominant ethnic/nationality group. In America, these are “whites” (see Waldinger, 2001). In Europe they can be labelled as “autochthons” (see Penn & Lambert, 2009). Primary labour markets are concentrated in capital-intensive industries such as chemicals (see Blauner, 1964; Nichols & Armstrong, 1976), steel (see Elbaum & Wilkinson, 1979; Kern & Schumann, 1984; Stigler, 1968) and paper-making (see Penn, 1990; Penn, Scattergood, & Lilja, 1992; Penn & Scattergood, 1984, 1987). There is relatively little labour turnover within the primary labour market. Working conditions are relatively good, opportunities relatively open and overall, such jobs are seen by social actors as attractive and desirable (see Grimshaw, Ward, Rubery, & Beynon, 2001).

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Model A

*Characteristics of the Primary and Secondary Labour Market*

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<b>Primary Labour Market</b>	<b>Secondary Labour Market</b>
High Wages	Low Wages
Job Stability	Job Instability
Permanent	Temporary/ 'Flexible'
Full Time	Part Time
Secure Employment	Insecure Employment
Unionized	Non-unionized
Capital Intensive	Labour Intensive
Good Working Conditions	Poor Working Conditions
Low Labour Turnover	High Labour Turnover/ 'Churn'
Acquire Skills on the Job	Few Acquired Skills on the Job
Career Ladders	Little Chance of Career Advancement
Attractive/ Desirable Jobs	Unattractive/ Undesirable Jobs
Autochthonous/ 'White'	Allochthonous/Non-white/ 'People of Color'
Male	Female

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Jobs in the secondary labour market are quite different. They are characterized by low wages, insecure employment and instability. Unions rarely feature and much employment is part-time and/or temporary (see Gallie, Penn, & Rose, 1996). In Britain, such work is referred to as “peripheral” or “flexible” (see Penn, 1992, 1996), whilst in the USA “nonstandard” or “contingent” are more common nomenclatures (see Kalleberg, 2003). Such work is generally undertaken by immigrants or women (or both) (see Waldinger, 2001). There are few opportunities to acquire skills on the job and there is little chance of career advancement. There is endemic labour turnover in the secondary labour market. Such work is concentrated in labour-intensive “sweatshops” such as clothing factories and large retail outlets. All in all, the secondary labour market strongly resembles both Marx’s “proletariat” of pure, unskilled, commodified labour and Weber’s subsequent model of “negatively privileged” workers. The fieldwork outlined below was designed to probe these models empirically in the context of modern logistics.

### **Post Modern Theories of Time**

A range of postmodernist theorists have posited the emergence of a new “form of time” in the contemporary era. Lyotard (1979) suggested that ‘time has ceased to be the measuring stick’ for work in post-industrial settings. Gorz (1988) also suggested that new production technologies, especially flexible equipment and lean production techniques like just-in-time deliveries, had transformed the workplace. The flexible machinery central to modern production is seen as liberating workers from standardized time. Paolucci (1996) argued that the time patterns associated with classic factory production outlined by Thompson (1967) and Pollard (1968) were no longer appropriate as the template for the post-industrial era. Time was now

“fragmented” and “multiple.” She claimed that “time measured in the function of rhythms and durations that are *the same for millions of persons* no longer constitutes the norm.” The clock is “no longer the undisputed regulator of time” (p. 146) and the “quantitative nature of time...has faded and lost its earlier cogency” (p. 147). She further claimed that “models based on inflexible and standardized times are being replaced” as a result of the “decoupling of capital from work” which she asserted was characteristic of post-Fordism. Schor (1998) went even further and argued that globalization allowed workers to “choose” their own hours of work. His speculative reasoning was based upon his peculiar understanding of how global financial markets and institutions operate. There is in fact no evidence that the continuous nature of global financial institutions has altered the patterns of hours of work in specific financial centres like London, New York and Tokyo. Indeed, post-modernist styles of analysis are characterized by minimal empirical evidence conjoined with grandiose claims such as those by Paolucci that modern workers “organize their own daily or weekly schedules” (p. 159) and that “the linear sequential time typical of the modern age is disappearing, as we are increasingly dominated by a perception of simultaneity and instantaneity” (p. 163). The research presented in this paper was set up to explore these ideas empirically within the sphere of logistics.

### **The Empirical Research**

The research reported below began during my sabbatical at UCLA in 2007. Initially I visited the port of Los Angeles. This is one of the world’s largest ports<sup>6</sup> and received 29 million tons of cargo from 500 container ships in 2008. Some of these include the latest post Panamax ships which carry over 11,000 TEU’s.<sup>7</sup> Around 45% of US imports come through Los Angeles, which is linked to the rest of the country by a complex network of super-freeways and new railway lines that pass through the Alameda Trench towards the Cajon Pass and ultimately to Fort Worth, Texas and beyond. 90 trains leave Pier 400 daily from the heart of the port. These trains are over 2,500 yards long, with 250 double-stacked containers pulled by four engines. I spent time at the port observing these activities, photographing the movement of goods and interviewing Port employees. From this beginning further research developed into the wider impact of the development of modern logistics.

The fieldwork undertaken since 2007 in Britain [mainly in the North West of England] extended this initial research. It involved a range of methods. These included the collection of visual materials in the form of photographs and videos, extensive observations and a series of interviews with social actors working within

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6 Currently Los Angeles is ranked 5<sup>th</sup> globally in terms of incoming container traffic. In fact it is two contiguous ports: Long Beach and San Pedro.

7 Twenty-foot equivalent units. This is the standard measure of container volumes.

logistics. Many of these were tape-recorded, and all were based upon semi-structured interview schedules. The empirical fieldwork was complemented with occupational data from the Labour Force Survey and the New Earnings Survey in Britain and the Bureau of Labor Statistics in the USA. Clearly the topic under scrutiny is complex and global in scope and the results presented subsequently in this paper are –in every sense– provisional.

### Work in Logistics

Logistics work in Britain is overwhelmingly undertaken by men. In 2007, 85.7% of those employed in transport were male, as were 74.7% of those employed in warehousing. This compared with 38.4% of retail employees. 98.5% of lorry [HGV] drivers were men in 2008 as were 96.7% of fork-lift truck drivers. All the fieldwork sites that were examined between 2008 and 2013 were almost entirely male, apart from the presence of women in clerical and managerial roles. One of the main reasons for this lay in the nature of the hours worked in both transport and warehouses. Drivers generally work long hours and start very early in the morning (see Table 1).

Table 1  
*Hours Worked by Heavy Goods Drivers in the UK*

	Standard	Overtime
1979	40.7	11.1
1989	40.9	11.7
1999	49.6	8.0
2008	42.8	8.8

*Source.* New Earnings Survey 1979-1999 and the Annual Survey of Hours and Earnings 2008.

Many spend nights away from home. As was shown in an earlier analysis of changing gender patterns for employment in textiles (see Penn, Scattergood, & Martin, 1994), the current dominant pattern of gender roles within households in Britain is one where women generally adjust their hours to accommodate childcare and other domestic responsibilities to a far greater extent than men. The growth of part-time female employment in retailing and public services is one aspect of this emergent form of family relationships (see Penn, 1995; Penn & Wirth, 1993). The long hours worked in transport and distribution represent its adjunct.

Work in logistics in the UK is full-time in the main. 94.4% of those employed as lorry [HGV] drivers in 2008 worked full-time, as did 93.1% of fork lift truck drivers and 90.4% of warehouse workers.<sup>8</sup> Logistics work often entails a very long working week. The maximum working week for truck drivers currently is 48 hours driving but this limit - as will be discussed below in greater detail – is routinely broken.

<sup>8</sup> Data for 2008 in this section are taken from the *Annual Survey of Hours and Earnings* (ASHE), 2009.

Hours of work in distribution are also long. Warehouse workers often work 9-10 hour shifts during the day and there is considerable use made of systematic overtime and weekend working. In 2008, warehouse workers in general averaged 5.4 hours of overtime per week.

Pay in logistics is relatively high both in the UK and USA. The median pay for all working in land transportation in the UK in 2007 was £25,176 and in warehouses it was £29,481. This compared to an average of £15,469 in retailing. In the United States, truck drivers received relatively high levels of remuneration (see Table 2). Their pay was around \$40,000 annually which compared well with skilled industrial workers like paper-workers and coal miners. It was not far behind classic skilled apprenticed trades such as carpenters or motor mechanics (see Penn, 1990). On the other hand, warehouse workers averaged significantly less than truck drivers, with average pay around \$27,000 per year. Nonetheless, such earnings are well above those of classic secondary labour market occupations like sewing machinists (around \$22,000 annually) and retail workers (around \$20,000).

Table 2  
*Numbers and Annual Earnings of Selected US Occupations, 2008*

<b>Occupation</b>	<b>Number [000]</b>	<b>Annual Earnings [\$000]</b>
General freight truck drivers	598.3	40.7
Specialised freight truck drivers	217.4	38.0
Paperworkers	21.6	41.1
Papermachinery mechanics	6.2	53.5
Coal mining machinery operators	6.0	46.7
Roof bolters [coal]	4.6	45.6
Electricians [coal]	3.3	51.4
Carpenters	397.9	43.7
Chemical plant operators	18.1	52.8
Chemical plant mechanics	4.7	49.6
Truck drivers [chemicals]	4.1	43.4
Automobile mechanics	216.5	42.8
Cashiers [grocery stores]	853.2	19.8
Department stores sales persons	509.8	20.6
Sewing machine operators	39.2	21.9
Warehouse workers	148.2	27.3

*Source.* "Occupational employment and wages," Bureau of Labor Statistics, U.S. Department of Labor, Washington D.C.

Trade unions have become much weaker over recent decades in both Britain and the USA. In 1980 55% of the workforce in the UK were union members. Today, less than 1 in 5 workplaces negotiate with unions over pay, hours or holidays: indeed 64% of workplaces currently have no union members at all (Department for Business, Enterprise and Regulatory Reform, 2009). In the fieldwork undertaken in the UK between 2007 and 2013, trade unions were conspicuous by their absence in all cases.



As one driver put it:

No drivers are taken on if they say they are union.

Another driver, with over 30 years experience in the industry, stated that:

Trade unions are not effective today.

This reflected the competitive nature of road haulage. As one driver stated:

Hauliers are hard-nosed, ruthless... it is a rough game, a tough business.

This is exacerbated by the proliferation of subcontracting and outsourcing within road transport and particularly within the home delivery sector (see Huo, Liu, Kang, & Zhao, 2015).

There remain pockets of unionisation in warehousing, notably among those of the larger supermarkets such as *Asda* or *Sainsburys* but to a large extent, unions have little impact on the day-to-day activities of most modern workers in logistics. In the USA, the Teamsters Union<sup>9</sup> remains a powerful force in the trucking industry but most distribution centres remain determinedly anti-union. Most employees in logistics in both countries come from dominant autochthonous, “white” ethnic backgrounds. At the four fieldwork sites visited in Britain, there was nobody employed from an ethnic minority background.

Overall, work in logistics was undertaken mainly by white males, working full-time with permanent contracts. However, the relatively good earnings available given the relatively low levels of entry qualifications were bought at a high price. Drivers worked long hours which were predominantly at unsocial times. There was little chance of advancement and few opportunities to obtain new skills or credentials at work itself. Work in warehouses was less anti-social in terms of hours but remained long and subject to extensive overtime. There were, however, greater opportunities for internal advancement within warehousing. It was possible to advance from a general warehouse worker to a counter-balance fork-lift truck driver once the appropriate license had been obtained. This could, in turn, lead to becoming a side-loader fork-lift truck driver once a further test had been passed. Learning new skills and obtaining new credentials on the job were an integral part of warehouse work. Within driving no parallel internal career trajectory was available.

### **Driving work**

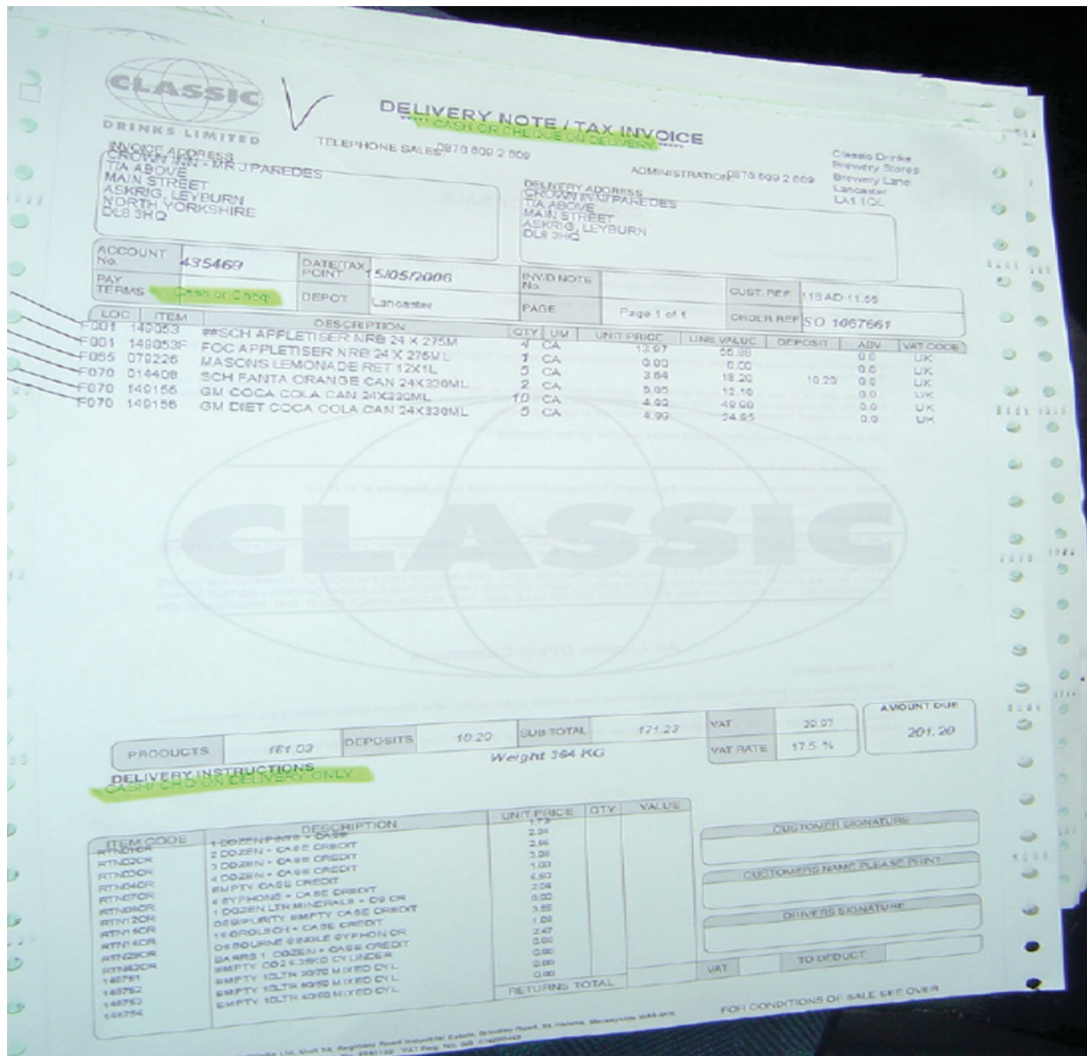
The work of a driver is determined by the intersection of three sets of external factors. The first is the road system, the second is the schedule of deliveries and

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<sup>9</sup> The International Brotherhood of Teamsters.

the third involves the legal constraints set upon driving in Britain by the British Government and the European Union.

The road system in Britain is a nightmare for drivers. Roads are far too crowded and this limits their ability to follow delivery schedules that have been determined by computer programmes designed mainly to minimise fuel costs (see Photograph 1). Many drivers now start at 4 a.m. in order to get a head start with deliveries. A start at 5 a.m. would lead to impossible sequences of deliveries and result in major extensions to the working day of between 2 and 3 hours, most of which would be both illegal and unpaid under most existing labour contracts. The driving jobs encountered at the four different fieldwork sites [food deliveries, drinks deliveries, white goods deliveries and international deliveries] were all governed by the principle of “job and knock” in which the driver finished (knocked off) as soon as he returned to his depot. Clearly it was in both the driver’s and his employer’s interests that he finished his work as soon as possible. However, road works, school runs, accidents and holiday traffic all



Photograph 1. Computerised delivery schedule.

make the road system entirely unpredictable and alienating. It stood as an external monster that could bring havoc and delays at any moment. Drivers had a variety of ways of dealing with this. None of the four firms examined in the fieldwork provided SATNAV in their wagons. However, drivers often purchased their own SATNAV and, in some cases, connected it to the internet via their mobile phone. One even phoned his wife at her workplace and got her to check the status of the road blockages on her own internet connection. Firms themselves offered little assistance but other drivers often provided advice or alternative routes by mobile phone.

Deliveries were sequenced, often in “windows.” These represent fixed periods when a driver could deliver to a customer. If the ‘window’ was not met, these customers would often refuse to accept deliveries immediately and the ensuing delay could have a punishing cumulative effect. This put enormous pressure upon drivers.

All the drivers interviewed spoke extensively about these pressures:

There is a lot of pressure to achieve these windows.

In order to achieve them you work harder and faster.

You work through breaks and break speed limits and everything to get there...you zig-zag backwards and forwards.

Another driver spoke of driving routinely at 40mph in built-up areas and often faster. A third driver spoke of doing 85mph on the motorways in his 7½ ton truck routinely to meet “insane” (his words) deadlines. Another spoke of working for a firm which set delivery schedules in Scotland from their office in Portsmouth that were impossible to meet and his working day involved endless reconfigurations of routes and deliveries: his working day often extended to 15 hours and sometimes up to 23! Most drivers also worked through both their standard and their “tacho” breaks. As one driver put it bluntly:

You need to be working whilst on a break which is illegal...but drivers want to get home and have their break at the end of the day.<sup>10</sup>

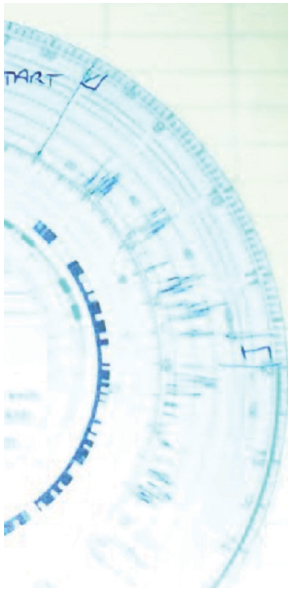
The third external factor is the law that regulates truck driving and imposes significant financial penalties on those who are unlucky enough to be caught breaking them. Information about hours of driving and speed is captured on a tachograph (see Photograph 2). However, as one very experienced driver put it to me

There is not a general haulier in the country who operates totally according to the law. None.

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<sup>10</sup> Drivers routinely put their tacho onto “break” (resting) and spend their time delivering during this time.

There are various dodges used to circumvent the current law, which limits drivers to 48 hours per week. One was for drivers to lose or destroy their tachograph cards and to hope that they were not spot-checked by the Ministry. Another method was to put down that there were two drivers, when in fact, there was only one. The third involved the three settings on a tachograph: “driving/resting/working.” One firm instructed their drivers to keep the tachograph permanently on resting.”<sup>11</sup> These methods are very much the “dark arts” or “Spanish practices” of road haulage and delivery work and reveal the limitations in scope of the current regime of surveillance and control.



Photograph 2. Tachograph.

### Warehouse Work

There were clear similarities in the working environment within warehousing to that in road transport. At *ABC* - a firm with around 100 employees manufacturing metal sub-systems - the warehouse would receive orders from the adjacent factory. This comprised 8 separate departments, all of which often wanted components at the same time. A core part of the job in the warehouse involved fork-lift truck drivers and warehouse workers using complex time-management skills to combine orders onto one pallet to save time. This required a sound grasp of where all the components were stacked and how they were integrated into various sub-systems within manufacturing. In addition, the warehouse was constantly receiving deliveries from outside suppliers. These came at prescribed delivery “windows” which had been narrowed to  $\pm 10$  minutes. As one forklift truck driver explained:

You were constantly rearranging what you were going to do. Re-jigging what was important ...what is important is not set in stone in the morning...it was constantly changing...

<sup>11</sup> This reminded me of being taught to leave my ticket machine permanently on “Cambridge Centre” when I worked as a bus conductor for *Eastern Counties* buses in 1972.

Management changed priorities constantly...you got grief from people in the factory if they had to wait for components...

Another warehouse worker put it accordingly:

You do not get to work and make a plan of the order you do stuff and then do it all day... you are constantly rearranging the way your work is organised.

The working environment in these warehouses was intense. Warehouse workers were under severe external pressure. They needed to coordinate deliveries and dispatches as well as reorganize the internal location of components and undertake monthly stock checks. Team-working was also an important feature of warehouse work. The workforce spent a considerable amount of time discussing how to get their work done. As one warehouse worker stated:

You are in a small group...because of time constraints, constant pressures things have to run smoothly. Everyone has to work with each other to do it. You have to liaise and fit in with other people's timings. You are in constant contact with other people. You have to discuss things.

Another fork-lift truck driver elaborated on this theme:

As a team, we'd have a chat and say we need to do this, this and this~ you go and do this and I'll do this and then we'll do that.

The system of monitoring warehouse workers had elements of both tight surveillance and "responsible autonomy" (see Friedman, 1977). Employees had to clock in but there was no real monitoring of the pace of work itself during the working day. This was determined by the nature of the work itself. It was self-directed in relation to an incessant flow of new activities and changed priorities. As one worker put it to me in response to my questions about monitoring:

You are always busy...there is no need to check if people are doing anything.

One fruitful area for future empirical research in this field could involve the spatial clustering of warehouses in specific locations like Crick and Haydock in England (see Chhetri et al., 2014; Sheffi, 2012; Waldheim & Berger, 2008). Classic theories of industrial districts and clusters of specialist skills could be applied to these issues in sociological depth (see Heuval et al., 2013).

## **Conclusions**

Work in contemporary logistics has many characteristics associated with the primary labour market (see Gutelins, 2015). Most of it is undertaken by men in full-time, secure, permanent jobs. There is relatively little labour turnover in these

jobs. Most workers come from the dominant ethnic group in both Britain and in the USA. Wages are relatively good. In America truck drivers earn nearly as much as skilled manual workers and almost double that of sewing machinists and supermarket workers. In Britain pay for truck drivers is relatively poorer but nonetheless very good given the low entry qualifications and general lack of lengthy training. Drivers are well paid given their lack of credentials but their wages are obtained at a high price in terms of long, unsociable hours. There is also considerable insecurity in their job. Drivers are forced to break the law systematically as part of their everyday activities. Tachograph rules, speed limits and load restrictions all put the onus for illegal activities overwhelmingly on drivers themselves. Fear rules the roads but the occupational culture of driving makes this an acceptable risk given the possibilities for relatively good earnings.

Warehouse work is better paid on average than driving but is also obtained on the basis of long, and often, unsocial hours. There are greater possibilities for internal movement up career ladders within warehousing when compared with driving. Neither driving nor warehouse work is strongly unionized in contemporary Britain nor America. However, unionization no longer signifies primary labour market status in Britain. This changed during the 1980s when male industrial manual workers became less and less unionized (see Penn, 1996, 2006) and the centre of gravity for union membership in Britain moved towards the public sector. Since 2003 more women than men have been union members and the majority of these are to be found in health, education and public administration (see Department for Business, Enterprise and Regulatory Reform, 2009). Paradoxically, truck driving remains more powerfully unionized in the USA and this is one factor determining the relatively high earnings for drivers there.

There was no evidence to support the claims of post-modern theorists about changes to time regimes from the data collected in logistics. Driving is characterized by intense time pressures. As a result of the overcrowded roads, drivers must start work at ever earlier times. The emergence of tight delivery windows means that drivers are engaged in a constant battle between computerized delivery schedules and the external realities of the road. Endemic speeding and systematic breaking of the laws regulating hours of driving are essential features of their work.

Warehouse workers are also under similar time pressures. They constantly reorganize their work to accommodate internal demands for the delivery of components with external deliveries and dispatches. In many ways employment in warehouses – traditionally categorised as service sector work – has come to resemble classic factory work. The working environment is physically demanding and potentially dangerous. Clocking-in remains the norm. Work is paced not by the workers themselves but –

much like an assembly line – by external forces. It is very similar in driving, schedules of delivery are designed that are only possible to achieve if traffic is moderate. The state of British motorways, particularly the M6 motorway which links the industrial belt between Liverpool and Hull with that in the West Midlands, is constantly clogged with traffic. The A14 arterial road to Britain's largest container port, Felixstowe<sup>12</sup>, is also often blocked. Drivers are forced to exceed speed limits but risk losing their jobs if convicted of speeding offences. They are also required to break the laws limiting hours of driving. As retailers and manufacturers increasingly rely on just-in-time deliveries, the job of drivers has become far more stressful and difficult particularly at times during the day when traffic is heavy or when the roads are blocked.

This leads drivers routinely to break speed limits, drive too close to other vehicles and generally to press as hard as they can. Accidents often occur and this simply makes the situation worse collectively. The surveillance systems built into vehicles are routinely either overridden or ignored. Such rhythms of work are a far cry from the putative flexibility and autonomy embodied within post-modernist accounts of time. They are far closer to the pacing of work embodied in the classic assembly-line. The logistics system can be seen as akin to a diffuse machine: indeed, as Goddard put it: “Au dehors de l’usine, c’est l’usine” (Outside the factory, It’s a factory).

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<sup>12</sup> Felixstowe receives over 1 million containers annually.

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