

BEKBULATOVA G.A. – c.g.s., assoc. professor (Almaty, Kazakh university ways of communications)

BAIRAMOVA M.D. – student (Republic of Uzbekistan, Nukus, Karakalpak state university named after him. Berdakha)

THE INFLUENCE OF THE DEMOGRAPHIC FACTOR ON THE TERRITORIAL ORGANIZATION OF PRODUCTION IN RURAL AREAS OF THE REPUBLIC OF KARAKALPAKSTAN

Abstract

This article analyzes the influence of the demographic factor on the territorial organization of production in rural areas of the Republic of Karakalpakstan and identifies the main trends in the development of production. The analysis of statistical data of rural areas is given, as well as suggestions for improving the current situation are given.

Key words: *demography, process, birth rate, population, settlement, rural area, production.*

BBK 81.2

BOKENKYZY A. – teacher (Almaty, Almaty technical-economical college of way communication)

THE HISTORY OF TRANSPORT SYSTEM IN THE UK

Abstract

The purpose of this article is to summarise the major changes affecting transport systems in the UK over the last 100 years.

The first section identifies significant points of change in the main transport modes. The second section addresses the principal factors accounting for these changes. The third section examines the consequences for the economy, social inequality and the environment. The article also refers to the overarching trends and issues for consideration. From the historical analysis five issues were identified as relevant to the future of transport in the UK.

Interactivity: while transport analysis and policy is often directed towards single modes (e.g. road, rail), it is clear that developments in some modes have been closely connected with those in others. Most journeys in the past were multi-modal. Mobility revolution: evidence points to a transformation in personal mobility in the later twentieth century, driven by consumer demand. Transformation has occurred in scale and scope in automobility, air travel and, more recently, rail travel.

Overload: one of the results of the surge in the circulation of people and goods has been overloaded transport systems: congested roads, crowded trains and airports. Sustainability: since the oil crisis of 1973 the sustainability of transport has been a major issue, encompassing renewable resources, carbon emissions and pollution. Government has worked towards greater sustainability but it remains a major challenge.

Alternatives: transport systems have been relatively stable over the last century, qualifying the idea of an imminent breakthrough to a new phase of transport. History suggests that change is as much a matter of recycling the old as introducing the new. The past thus remains an important resource for transport alternatives in the future.

Keywords: *technological innovation, slowness to modernize, transport infrastructure, consequences of changes in transport, the interactivity of systems, overloaded systems, traffic congestion, 'twilight' areas, Great London Smog.*

Introduction.

The purpose of this article is to bring a historical perspective to the project on the future of mobility in the UK. It aims to illuminate the project in a number of ways:

- Identifying long-term trends and patterns in UK transport;
- 'Learning from the past': understanding why developments succeeded or failed;
- Recognising path dependence and the limits to as well as the opportunities for change;
- The past as a repository: borrowing examples, which might have benefits in the future.

This review is not therefore a narrative history but an attempt to bring historical knowledge to bear on future directions in UK transport policy. It is concerned with transport systems in the conventional sense (railways, roads, air, etc.) but also with mobility, forms of movement such as walking and cycling often omitted from transport history and policy.

The review concentrates on the century between the end of the First World War and the present day as the period most relevant to understanding future challenges. It is divided into four sections. The first section describes the most important points of change in the main modes of transport over the last 100 years. The second and third sections examine the principal causes and consequences of those changes. The concluding section identifies overarching trends and issues arising from the history of transport and mobility.

What were the significant moments of change during the twentieth century?

There was no common pattern of historical experience among the various modes of transport during the twentieth century. The winners were automobility and air travel, both of which experienced growth rates that outstripped contemporary predictions. Almost all other transport modes suffered from competition with them. These included walking, which underwent continuous decline; passenger shipping, the main means of international transport before the 1950s; rail freight, under pressure from road haulage from the 1920s; and buses and trams which, like other forms of public transport, lost out to the private car. Some declining modes saw recovery in the late twentieth century, notably sea freight and passenger rail.

Significant periods of change include the years after the world wars, when much passenger travel and freight transport was reorganised. The 1960s, years of experiment in transport as in much else, saw containerisation and rapid expansion of air travel, car ownership and motorway construction; with the last decades of the twentieth century experiencing privatisation of important parts of the air and rail systems, and the state promotion of major infrastructure projects.

a) What were the main drivers of change?

Analysing why change occurred is tricky because of the intersecting pressures which have affected transport modes differently. Broadly, four 'drivers' served to shape UK transport systems during the twentieth century.

The most powerful was consumer demand, predicated on a rising standard of living for much of the century. It prompted the spread of the bicycle between the wars, the expansion of car ownership under conditions of 'affluence' from the late 1950s, and the growth of package holidays abroad from the 1960s, fuelled by cheap flights.

Two further drivers were war and technological innovation. Wartime, when the state took control of transport along with other national resources, was the precursor to post-war intervention in The history of transport systems in the UK the name of greater efficiency. The two world wars boosted Britain's pioneering role in aviation and motor manufacturing, which transferred into peacetime gains. Technological innovation in these sectors was significant, especially in manufacturing, with the Mini and Concorde products of the expansionist 1960s. However, innovation in technology was not matched in infrastructure, where much of the stock

remained antiquated. Only from the 1990s was large-scale investment in transport infrastructure other than roads undertaken, based on public-private partnership.

Government policy was a further, although less dynamic driver of change, setting the framework for transport, through regulation, ownership and subsequent privatisation. Through taxation it funded the motorways programme from the late 1950s and promoted transport research in areas such as road safety and civil aviation. But with some exceptions, government was reactive rather than proactive in relation to transport. Historically, Britain has not been a dirigiste state on French or German lines, although initiatives such as the Channel Tunnel and HS2 may be changing this pattern.

b) What were the consequences of changes in transport?

There have been consequences in three main areas. Transport changes had a significant effect, firstly, on the economic fortunes of regions and industries. Transport has consistently employed over a million workers with more in allied industries. It has had long-term consequences for regional economic growth and decline as the divergent fortunes of ports like Southampton and Liverpool indicate.

Secondly, mobility has been an important contributor to the growth of individual choice, especially for women. The car has been seen as a contributor to women's emancipation. At the same time, inequalities have been mirrored in and reinforced by lack of mobility, measured by the proportion of households in 'transport poverty', cut off from employment and services. Among those most affected have been the young, older people and people living in rural areas.

Thirdly the changes in transport have had a series of unintended consequences. These include traffic accidents and congestion, but the most fundamental have been the consequences for the environment from air pollution and climate change, emerging in the last third of the twentieth century. Automobility and roads were the main source of negative externalities, associated also with 'sprawl' and 'blight'.

Conclusion: overarching trends and issues.

What conclusions can be drawn from this historical survey for the present and future of mobilities in the UK?

Significant moments of change.

This section examines the principal changes in the history of UK transport over the last 100 years, broken down by mode. The later sections will analyse the relationship between the changes described in more detail but it should be borne in mind that they occurred interactively with developments in other modes.

Walking

Frequently neglected as a mode of transport, walking remained the commonest form of mobility throughout the last century. The effects of mass public transport and private automobility made walking less publicly visible in some cases but not necessarily less frequent. Between the 1890s and the 1930s walking was the most common form of getting to work and it remained the main means of commuting for one-third to one-fifth of the population in smaller towns and cities as late as the 1970s [1].

Early twentieth-century film shows pedestrians moving freely around streets, weaving between trams and horse-drawn traffic. Between the wars the growth of motor traffic led to record road deaths among pedestrians as well as motorists, and a rapid rise of casualties to over 200,000 a year. Partly as a result walkers were pressed by planners onto pavements and sequestered behind railings away from roads. The Pedestrians' Association was founded in 1929 to push for improvements such as Belisha beacons and speed limits for motor traffic.

The onset of mass automobility after 1950 meant that walking became even more hazardous, especially in built-up areas, and increasingly invisible in planning. While motorways were built to accommodate traffic, walkers were forced into subways or onto bridges and raised walkways away from roads. As part of the reaction against roads and motorisation, city centres were pedestrianised after 1970; Reading and Leeds were two early examples where traffic was excluded from the central zone in favour of walking.

From the 1970s walking began to enter the domain of transport policy. It was increasingly conjoined at governmental level with health policies that stressed the benefits of an active lifestyle and with urban policies that emphasised sustainable transport as a corollary of sustainable cities. Nevertheless, walking seems to be declining as a way of getting about in the twenty-first century. Walking fell from 27% to 22% of all trips between 1995/7 and 2012, interviews suggesting that people see it as less safe and ‘normal’ than walking appeared in the past [2].

A Transport for London report from 2015 indicated that the number of ‘walking all the way’ trips increased by 9.3% between 2008 and 2014 – exactly the same figure as for population increase in the capital over this period. This suggests that London bucked the national trend in walking and may also indicate a significant correlation between walking and population density.

Cycling

Cycling developed in the late nineteenth century, primarily as a leisure pursuit. Although initially pursued by the well-to-do, it was quickly taken up by the better-off working class. The opportunities the bicycle gave for moving beyond the town was one of the reasons given for the weakened control of employers over factory workers in Lancashire textile towns in the 1890s [3].

By the inter-war years, the use of bicycles spread more widely, aided by the growth of mass production firms, such as Nottingham-based Raleigh, which made Britain a world-leader in bicycle manufacturing. Cycling received official support from the Ministry of Transport, with 280 miles of cycle lanes constructed as part of new roads between 1934 and 1940. By the late 1940s when the number of bicycles in the UK reached its peak, cycling was second only to the bus as a means for people to get to work, accounting for one-fifth of all such journeys. After 1950 the bicycle declined as a mode of transport in the face of competition from motorbikes and the private car. Decline was continuous to the mid-1970s, when it levelled off, and usage has fluctuated to the present.

Between the 1940s and the 1970s cycling was largely absent from the policy agenda; since the 1970s, however, cyclists have been as vocal as road users, channelling their demands through organisations such as the Cyclists’ Touring Club (later Cycling UK). From the late 1970s pressure groups like Sustrans began to create cycleways, such as the Bristol and Bath Railway Path. Nevertheless, a European Commission report in 1989 ranked the UK as one of the worst countries for conditions for cyclists. It was only in the 1990s that official attitudes began to change with the publication in 1994 of A Blueprint for Cycling Policy by the Department for Transport, quickly followed in 1996 by the UK’s first National Cycling Strategy and a National Cycling Network which came to encompass 12,000 miles of route.

Rail

The major period of expansion in the UK’s railways system occurred in the half-century between the 1840s and the 1890s. The majority of the railway network was established by the 1870s; the last mainline to London, the Great Central Railway from Sheffield via Nottingham, was opened in 1899. On a number of counts the railways peaked around the First World War. The length of national track levelled out at around 20,000 miles; 1920 appears to have been the highest year for number of rail journeys (2,186 million); and rail freight by tonnage peaked in 1924.

Between the 1920s and the 1980s, the railways entered a lengthy decline. Both passenger and freight traffic experienced sharp contractions, especially in the depression years between the wars. Freight in particular never recovered the pre-war level of 1913. The tonnage of coal carried by rail nationally fell 16% between 1913 and 1937, while the companies operating in coal-producing regions saw mineral traffic more than halved. As a result, the profitability of the private railway companies reduced in the inter-war period.

Central government, which took control of the railways in both world wars, responded by reorganising the industry. Following the Railways Act of 1921, the 120 existing railway companies were amalgamated into four, each with an effective monopoly of an area of the

country. The reasons for amalgamation were threefold: the pre-war rail system was recognised as highly inefficient, Carlisle, for example, being served by seven different companies; state control during wartime showed how the system could be made more productive, carrying 50% more freight and large movements of troops; and the ending of state control after the war highlighted the parlous financial situation of many of the smaller companies. In 1947 the government took the railways into national ownership under the control of the British Transport Commission [4]. Trams and light rail saw a decline from the 1930s, and buses replaced trams in the course of the 1950s; Glasgow being the last large British city to abandon its trams in 1962.

State policy from the mid-1950s favoured making the railways more commercially competitive and modernisation programmes were undertaken by successive governments. Diesel and electric track replaced steam by the 1960s, but their immediate effect was limited. Deficits were recorded in every year from 1956, with a loss of £104 million in 1962. It was in this context that the Beeching report, *The Reshaping of British Railways*, was published in 1963. Intended to restore commercial viability under a new Railways Board, the report recommended closing uneconomic lines and stations, developing inter-city routes and overhauling freight with a combined road-rail container service.

The effects of Beeching were drastic, for stopping and suburban services especially. Altogether, the report envisaged the closure of 9,000 of the total 18,000 route-miles. In the event some 7,000 route-miles had been cut by 1970, the number of stations was reduced by almost two-thirds and the rail workforce almost halved. The cuts were unpopular with the travelling public and Beeching became a symbol of the victory of narrow bureaucratic economism over the values of public service. From 1968 the government sought to restore the position of the railways but the spiral of decline continued in passengers and freight, with annual deficits escalating to £677 million by 1980 [5].

Shipping

Britain entered the twentieth century as the world's leading maritime power. During the course of the century it suffered decline, relative in amount of cargo carried and absolute in passenger traffic. Shipping included passenger liners, freight liners and tramp ships and was divided between ocean-going and coastal traffic. After 1900 steam ships increasingly replaced sail.

Like other transport modes, shipping enjoyed a brief boom after the First World War but the economic slump between the wars badly affected maritime trade, especially among tramp ships which were hit by the collapse of coal exports. Passenger liners also suffered; emigrant traffic from Europe, which had been so voluminous in the decades around 1900, all but disappeared by the 1930s. As a result, the UK's share of world tonnage fell from 43% in 1914 to 26% in 1938.

The falling share of the world shipping trade in freight continued after 1945. By 1970 the UK's share of world tonnage had shrunk to a mere 11%. The reasons were multiple: competition from foreign fleets and the spread of flags of convenience; slowness to enter lucrative, new forms of trade, such as oil; antiquated shipping that remained tied to steam; and antiquated infrastructure in ports unable to adapt to new types of trade. In the same period, the number of air passengers overtook those going by sea for long-distance journeys by 1960 and for all international travel by 1965.

While parts of coastal shipping and docks were nationalised under the 1947 Transport Act, much of the shipping industry remained in private hands and fragmented. Six different authorities were responsible for Britain's ports in the 1960s. The decline of shipping concerned government less than the railways, although the Rochdale Committee of Inquiry which reported in 1970 demonstrated official anxiety about the state of the industry. In particular, the committee recommended investment in the country's docks to accommodate tankers and containers. The state also intervened by setting up Freightliner in 1965 to integrate the growing sea container business with rail freight. But all this did not stem the decline of the British merchant fleet.

Between 1975 and 1995 the number of British vessels greater than 500 tonnes shrank dramatically from 1,682 to 365.

With containerisation the historic pattern of Britain's ports changed: Felixstowe and Southampton emerged as the most important sites for the new containers, Immingham for bulk goods like coal, eclipsing the old ports of London and Liverpool. This shift enabled a renewed growth in cargo after 1990. The orientation away from the Atlantic trade to Europe was confirmed by the expansion of Folkestone and Dover for Cross-Channel traffic in passengers and road haulage from the later 1950s. Short haul sea-ferries from the Channel ports have been undercut by low-cost airlines and international high-speed rail. Since the opening of the Channel Tunnel in 1994 the main area of passenger growth has been in cruise ships, operating from a number of ports around the British Isles including Southampton, Holyhead and Orkney.

Automobility Automobility was the single most dynamic transport mode during the twentieth century. It encompassed all forms of motorised transport, from lorries and buses to cars and motorbikes.

Britain was a motoring pioneer. Cars were manufactured from 1896 and a number of leading marques like Austin, Rover and Sunbeam were launched before the First World War. A national road network was already in place and a classified system of A and B roads from 1922 with 'trunk' roads designated as a separate category was introduced from 1937. In 1920 the government established a Road Fund, using revenue from excise duty on vehicles and the sale of licences to pay for road improvements; and it introduced the driving test in 1935. With the major motoring organisations, the RAC and the AA, in existence by 1905, Britain between the wars possessed an established motoring culture, exemplified by the unique Shell Guides published from the 1930s.

By the Second World War there were some two million motor vehicles on UK roads. But the most striking innovation in this period was not so much the growth of private car ownership as of road haulage and motorised public transport. Much of this expansion was at the expense of railways. While almost all categories of rail freight declined between the wars, numbers of goods vehicles increased five times to 488,000, the great majority owned by small independent operators. Public bus transport also increased exponentially, with 100 local authorities running municipal services by 1932, together with a host of private companies. London was a special case. From 1912 the Underground Group sought to coordinate the capital's public transport system but the increase in the number of private bus companies in the 1920s meant the situation was chaotic. In 1933 all transport services – rail, tram, underground and bus – were coordinated under the London Passenger Transport Board, the largest such undertaking in the world.

In recovery from near bankruptcy after the Second World War, the motor industry led the way in exports, enabling the British economy to stabilise after 1950 and domestic consumption to grow. It was from this period that the phase of mass motorisation took off. The rapid expansion of car ownership - increasing five-fold between 1950 and 1970 – was a key marker of 'affluence', so that for the first time a car like the Mini or the Ford Cortina came within the reach of manual workers and their families.

These decades also saw the British motor industry reach its zenith to become the most important industry in the country, producing more than a million cars for the first time in 1958 and employing over 500,000 workers by 1965 [6]. Other types of vehicle also participated in the 'motor revolution'. Motorcycle ownership reached a peak in the early 1960s. Buses replaced trams in the course of the 1950s; Glasgow being the last large British city to abandon its trams in 1962. The numbers of lorries also doubled in the 1950s and 1960s, including the new 'juggernauts' of over eight tonnes.

Nevertheless, British society was comparatively under-prepared for the 'motor age'. It lacked the infrastructure of motorways of North American and European countries; the first extended length of the M1 was only opened in 1959 and Britain achieved the target of 1,000 miles of motorway only in 1972. By 1960 there were serious concerns about the impact of traffic on the physical environment of British cities, leading the government to commission the

Buchanan report, *Traffic in Towns* (1963). The report proposed restrictions on traffic in urban areas alongside wholesale reconstruction of cities to accommodate the rising tide of cars. The 1960s saw a plethora of experiments, from the driverless car to the installation of computerised traffic control systems. At the same time, government policy towards transport remained based on the principle of 'predict and provide'.

By the later twentieth century the UK had become a car-dominated society, the number of cars in the UK more than doubling from 11 to 23 million between 1970 and 2000. This rise reflected the increase of women as drivers. In the 1960s less than one-fifth of all women held a driving licence compared to half of all men; by the early 2000s almost two-thirds of women had acquired a licence.

Although still higher than for women, the proportion of men with a driving licence has remained relatively constant at four-fifths since the early 1990s.

At the same time, concerns about mass motorisation did not go away. Fears were associated initially with the effects of air pollution, especially from lead emitted by motor vehicles. The Department of the Environment published successive reports on the threat from air pollution, in 1969 and 1972, and the evidence of lead pollution mounted during the 1970s, partly stimulated by the opening of new urban motorway systems, such as the Gravelly Hill Interchange (informally known as Spaghetti Junction) in Birmingham [7]. After 1985 emissions from motor transport became associated with climate change. Studies have estimated that transport accounted for roughly one-quarter of all UK carbon emissions, the main source of greenhouse gases which cause global warming.

The drivers of change

We do not have a comprehensive history of change and its causes in the domain of transport. Historians agree that the development of transport modes has been identified with new sources of power and energy – coal for the steam age, for example, oil for the era of the internal combustion engine. However, factors driving change tend to be seen as specific to a particular transport mode, such as shipping or automobility, rather than transferable across modes. Recent historians of transport and mobility also avoid the assumption that each new form of transport necessarily improves mobility. A recent study goes so far as to argue that had the use of the private car been restricted in twentieth-century Britain, patterns of mobility would not have differed greatly.

This section identifies those drivers of change in modern transport history that historians have identified as most important across a range of transport modes. The drivers are grouped into four broad categories. The developments overlapped in many cases and did not work independently. We give some indication of this last point in the historical examples provided.

Technological innovation

Transport has been a fertile area for technological innovation and Britain has a long tradition of heroes from Thomas Telford, the eighteenth-century builder of roads and canals, to Alec Issigonis, the designer of the Mini. Britain also had a pioneering role in the development of canal and railway systems, including the London Underground from 1863. During the 1950s and 1960s British car designers and manufacturers led the world in producing a series of iconic cars: the Mini Cooper, Aston Martin DB5 and the Jaguar E-type. In the mid-twentieth century, Britain and France were the instigators of the first supersonic passenger aircraft, Concorde, a technological first. Meanwhile British transport planners, such as Colin Buchanan, author of *Traffic in Towns*, and Peter Hall, inventor of the 'Freeport', a precursor of the enterprise zone, were influential figures internationally.

But if technological innovation has been the hallmark of UK transport, one of the features of the twentieth-century transport system has also been its stability. British Rail was late in electrifying main lines. On the roads, government was tardy by international standards in constructing a national motorway network.

Why innovation in some sectors, like aviation, and slowness to modernise in others, like shipping? In reality, innovation occurred in pockets rather than sectors as a whole. So in the mid-

twentieth century, British motor manufacturing was highly successful in creating luxury models and marques, like Jaguar, Bentley and Rolls-Royce, but less successful in the mass The history of transport systems in the UK 16 car market where companies like British Leyland became a by-word for unreliable, poorly built models.

Moreover, before the twentieth century, the limited tradition of governmental investment in transport infrastructure (only in Britain were the railways developed entirely by private capital) meant that the state rarely acted as an innovator, at least in peacetime. The British state could be influential in creating the conditions for technological innovation, as with aerospace, but it seldom took the lead. Initiatives such as the Victoria and Jubilee underground lines (1968/1979) and Docklands Light Railway (1987) were restricted to London. Recent state-driven infrastructure projects like the Channel Tunnel, HS2 and CrossRail arguably represent a break with the past in this respect; their ambition is greater in both geographical and politicoeconomic terms than was the case with earlier initiatives.

There is plenty of evidence of failings at sectoral and governmental levels, but it is important to balance these with evidence of innovation in both private and public sectors. Government invested consistently over time in transport-related technology, for example through the Road Research Laboratory, which, alongside private research agencies such as MIRA, helped to pioneer new approaches to automobility and road safety from the 1950s. [8] Overall, the incidences of failure in the motor industry, British Rail and shipping should be offset by the strengths and dynamism evident elsewhere in Britain's recent transport history.

The consequences of change

The consequences of changes in patterns of transport and mobility are difficult to assess. This is partly because they are hard to isolate from other historical trends, such as deindustrialisation, but partly also because they are still playing out. We have chosen here to group consequences under three headings: economic growth and decline; social inequalities; and unintended consequences, which include environmental impact.

Unintended consequences. Changes in transport have had consequences often unforeseen by policy-makers. Congestion and traffic 'accidents' are two such examples. From the 1930s planners designed new road systems to alleviate traffic congestion but by the 1960s (or even earlier) it was clear that there was no 'engineering solution' to the problem; traffic merely expanded to fill the new road space, creating 'induced traffic'. Traffic 'accidents' are likewise no such thing; rather, they are statistical regularities, the numbers of which can be calculated precisely year on year. As policy-makers have come to recognise, transport can be paradoxical and counter-intuitive in its effects. Transport has had unanticipated consequences for the surrounding environment. In the nineteenth century the construction of new railway routes in built-up cities like London meant that thousands of people were displaced. One result was to multiply housing problems, exacerbating crowding in nearby 'slums'; the phrase 'the wrong side of the tracks' took on a literal meaning. The construction of new road systems from the 1960s also provoked a new phenomenon, 'blight', associated with falling house prices close to the new roads and in some cases the unwitting creation of 'twilight' areas, neighbourhoods cut off from the larger city, with dwindling facilities, a shrinking population and a deteriorating urban fabric. Over a long period, pollution from steam trains and motor vehicles has affected the air citizens breathe. The Great London Smog of 1952 was caused primarily by smoke from coal fires, but vehicle emissions from cars and buses also contributed. From the 1970s there were concerns about lead emissions from petrol, and their impact on the brain activity of children in inner-city areas. There have been continuous concerns since then about the effects of pollution from transport on lung disease and other physical and mental disorders; documented and debated in a series of official reports. [9] Modern transport systems produce effects at a global environmental level. The most obvious is the consequence of emissions from aircraft and motor vehicles, multiplied by the rapid. The threat of climate change as a result of greenhouse gases, to which transport has been a major contributor, is potentially the most significant unintended consequence of all.

Conclusion.

The interactivity of systems. The history of the last 100 years shows that transport modes are deeply inter-related with one another. In some cases this relationship has been to the detriment of one or more modes. While the advent of the railway in the 1830s and 1840s undermined (though it did not wholly destroy) the primacy of canals in the carriage of land-based freight, the private car and road haulage from the 1950s successively undid the tram, rail and bus systems, competing with them and putting in question their commercial viability. Cycling and walking were similarly side-lined by the spread of the private car.

In other cases, the relationship has been complementary. Rail freight stimulated road transport to and from the rail head; most journeys to work combined a number of different modes, including walking. Multi-mode travel is indeed one of the most persistent features of mobility. Industrially, interactivity includes transfer, most conspicuous in the technological development of the motor and aviation industries, firms such as Rolls-Royce and Lucas being involved in both while the switching of wartime production encouraged flexibility in manufacturing processes which helped to make both major industries of the post-war period. An implication is that transport and mobility need to be thought of laterally and integrally rather than sequentially and separately.

A mobility revolution. A number of recent commentators have suggested that the UK witnessed something akin to a revolution in personal mobility in the later twentieth century. The evidence of this review indicates that transformation was most marked in automobility where private car ownership has continued to rise steadily, doubling between 1970 and 2000, and international air travel, where passenger numbers passing through UK airports increased twenty-fold between 1960 and 2000. The number of passengers travelling by rail has also doubled since the 1990s. Consumer demand has frequently been a key agent of transformation, in the personalisation of transport (the private car), leisure and tourism. Other factors, though, have also driven the rise in mobility including house prices, changing work practices and patterns of educational uptake.

This unprecedented upsurge in mobility has been largely overlooked by historians, though identified by some recent sociologists with the ‘mobility turn’ and the concept of hypermobility [10]. Hypermobile individuals take frequent trips, often over great distances. The trends in travel are significant, particularly when viewed in conjunction with increased geographical mobility among the UK population for education, work and leisure since the 1960s. Significantly, too, the continuous expansion of travel over the period has increased faster than economic growth and more or less independently of other major economic and political shifts. A slowdown was apparent in automobility following the 1973 oil crisis and in air travel following the 2008 crash. But there are no signs that the revolution is over or that it is being reversed, despite talk of a ‘new localism’.

Overloaded systems. Transport systems in the UK have suffered from recurring problems of overload. Traffic congestion has been more or less consistent since the 1930s, forcing local authorities in cities such as Manchester to establish traffic congestion committees [11].

Other transport forms have likewise suffered overload. The railways struggled to cope with the numbers of passengers after the First World War and then again from the 1990s; airports have been forced to expand reactively to cope with the exponential growth of passengers since the 1960s. UK population growth from 52 million to 65 million between 1960 and 2015 is one factor. Another is the failure at policy level to connect transport with other forms of planning such as land use. But overload is also a consequence of the success of much of the transport sector: automobility, air travel, and, more recently, rail travel, have proved to be some of the fastest growing areas of the economy during the last 50 years.

The problem of overload is equally the legacy of early industrial and economic development which means that much of the infrastructure is old. Old rolling stock and track held back the railways from the 1920s; lack of appropriate berthing space meant that many British ports could not accommodate the new tankers and container ships from the 1950s. In 1961, 60%

of Britain's fixed capital stock in railways and 54% in harbours, docks and canals was constructed before 1920. The legacy of the past resulted in transport systems becoming locked in to path dependency. Innovation was hampered by old infrastructure, fixed capital and inherited working practices which meant that significant change in transport systems required large financial investment and sustained political will. As recent academic commentators have stressed, new plans for transport that ignore inherited networks, modes and behaviour are unlikely to succeed.

Towards sustainability. Transport has been a major source of energy consumption and pollution: coal-burning steam trains, petroleum-fuelled and carbon-emitting cars, buses and lorries. Though the effects of these on the environment from smog to carbon deposits were acknowledged by the 1950s, it was only after 1970 that a wider environmental awareness emerged in Britain.

Since the oil crisis of 1973 the question of the sustainability of transport systems based on non-renewable fuels has been raised and is now a central factor in the regulation and planning of transport. The British state has played an important role in disseminating knowledge of the environmental effects of transport and in tightening the regulatory framework in areas such as emissions; motor and aviation manufacturers and pressure groups have also played a part.

The presence of alternatives. Transport is a domain in which change has taken place slowly, despite the rapid growth in personal mobility. All of the transport modes discussed in this review have existed for over a 100 years and their form has altered relatively little. A modern aeroplane or car would be easily recognisable to anyone alive in the 1920s. Transport systems are resilient and enduring, and change is likely to be gradual, not sudden.

At the same time, the past is a resource for a large number of options that were not taken up or which were taken up much later. A prototype of the driverless car was first developed and tested by the Road Research Laboratory in 1960 and some of the first cars to be built were electric, but neither of these technologies was developed commercially at the time. The 1960s were a particularly fruitful time for innovations in traffic planning. Some of the innovations, like the application of computer systems to road signalling, were taken up; others, like road pricing, only took hold to a limited extent and at a later date, with toll roads and congestion charging [12]. The 1960s were also a time of experimentation with all sorts of personal and public transport, from the hoverpad and the microlight to the rickshaw taxi and the monorail. Most of these were not developed. In some cases, transport modes from the past have made an unexpected reappearance; trams and light railways, abolished in the 1950s, have been re-installed in eight UK cities. Since the 1990s the transport sector has seen the emergence of a number of unplanned 'disrupters' of existing systems, such as Uber cars and low-cost airlines, as well as the introduction of creative concepts such as car-pooling and bicycle hire schemes, all encouraging multi-modal transport use.

What this suggests is that the idea of transport developing in a linear fashion, with one or several modes replacing others, is misconceived. The history of transport in the UK is a story of surprising reversals and survivals. Planners' emphasis in the mid-twentieth century on the petroleum car over all other modes now looks like a mistake because it overrode the many different mobilities, which co-existed with automobility. The transport alternatives of the past are thus more than interesting relics. They may well offer clues to our multi-modal future.

References

1. Pooley C.G. and Turnbull J. (1999). The journey to work, p. 281-292.
2. Pooley C.G. and Horton D. (2014). 'You feel unusual walking': the invisible presence of walking in four English cities. *Journal of Transport and Health*, p. 260-26
3. Joyce P. (1980). *Work, Society and Politics*. Hassocks, Sussex: Harvester Press
4. Barker T.C. and Savage C.I. (1974). *An Economic History of Transport in Britain*. London: Hutchinson.

5. Loft C. (2006). Government, the Railways and the Modernization of Britain. Gourvish T.R. (1986). British Railways, 1948-1973. Cambridge: Cambridge University Press.
6. Church R. (1994). The Rise and Decline of the British Motor Industry. Cambridge: Cambridge University Press.
7. Gunn S. (2018). Ring road: Birmingham and the collapse of the motor city ideal in 1970s Britain. The Historical Journal, Vol 61, March 2018, p227-248.
8. Charlesworth G. (1987). A History of the Transport and Road Research Laboratory, 1938-1983.
9. Sheail J. (2002). An Environmental History of Twentieth-Century Britain.
10. Sheller M. and Urry J. (2006). The new mobilities paradigm. Environment and Planning.
11. Pooley C.G. and Turnbull J. (1999). The journey to work. A century of change. p. 281-292.
12. Rooney D. (2016). The Traffic Problem. Geographies, Politics and Technologies of Congestion in Twentieth-Century London.

Литература

1. Pooley C.G. and Turnbull J. (1999). The journey to work, p. 281-292.
2. Pooley C.G. and Horton D. (2014). 'You feel unusual walking': the invisible presence of walking in four English cities. Journal of Transport and Health, p. 260-26
3. Joyce P. (1980). Work, Society and Politics. Hassocks, Sussex: Harvester Press
4. Barker T.C. and Savage C.I. (1974). An Economic History of Transport in Britain. London: Hutchinson.
5. Loft C. (2006). Government, the Railways and the Modernization of Britain. Gourvish T.R. (1986). British Railways, 1948-1973. Cambridge: Cambridge University Press.
6. Church R. (1994). The Rise and Decline of the British Motor Industry. Cambridge: Cambridge University Press.
7. Gunn S. (2018). Ring road: Birmingham and the collapse of the motor city ideal in 1970s Britain. The Historical Journal, Vol 61, March 2018, p227-248.
8. Charlesworth G. (1987). A History of the Transport and Road Research Laboratory, 1938-1983.
9. Sheail J. (2002). An Environmental History of Twentieth-Century Britain.
10. Sheller M. and Urry J. (2006). The new mobilities paradigm. Environment and Planning.
11. Pooley C.G. and Turnbull J. (1999). The journey to work. A century of change. p. 281-292.
12. Rooney D. (2016). The Traffic Problem. Geographies, Politics and Technologies of Congestion in Twentieth-Century London.

БӨКЕНҚЫЗЫ А. – оқытушы (Алматы қ., Алматы қатынас жолдарының техникалық-экономикалық колледжі)

ҰЛЫБРИТАНИЯНЫҢ КӨЛІК ЖҮЙЕСІНІҢ ТАРИХЫ

Аңдатпа

Осы мақаланың мақсаты – Ұлыбританиядағы соңғы 100 жылдағы көлік жүйелеріне әсер еткен негізгі өзгерістерді қорытындылау.

Бірінші бөлімде негізгі көлік режимдерінің маңызды өзгеру нүктелері анықталған. Екінші бөлім осы өзгерістерді ескеретін негізгі факторларды қарастырады. Үшінші бөлім экономика, әлеуметтік теңсіздік және қоршаған орта үшін зардаптарды қарастырады. Мақалада негізгі тенденциялар мен қарастырылатын мәселелер туралы

да айтылады. Тарихи талдаудан Ұлыбританиядағы көлік болашағына қатысты бес мәселе анықталғандығы туралы.

Интерактивтілік: көліктік талдау мен саясат көбіне бір режимдерге бағытталса (мысалы, автомобиль, теміржол), кейбір режимдердегі өзгерістер басқаларымен тығыз байланысты болғаны анық. Бұрынғы саяхаттардың көпшілігі көпмодальды болған.

Ұтқырлық төңкерісі: дәлелдер тұтынушының сұранысына негізделген XX ғасырдың кейінгі кезеңіндегі жеке мобильділіктің өзгеруіне нұсқайды. Трансформация масштабы мен ауқымында автомобильділікте, әуе қатынасында және жақында теміржол қатынасында болды.

Шамадан тыс жүктеме: адамдар мен тауарлар айналымының күрт өсуінің нәтижелерінің бірі – көлік жүйелеріне шамадан тыс жүктеме болды: кептелген жолдар, адамдар көп жиналатын пойыздар мен әуежайлар. Тұрақтылық: 1973 жылғы мұнай дағдарысынан бастап көліктің тұрақтылығы жаңартылатын ресурстарды, көміртегі шығарындылары мен ластануды қамтитын маңызды мәселе болды. Үкімет орнықтылық үшін жұмыс істеді, бірақ бұл маңызды мәселе болып қала береді.

Альтернативалар: көлік жүйелері соңғы ғасырда салыстырмалы түрде тұрақты болды, бұл көліктің жаңа кезеңіне жақындаған серпіліс идеясын талап етеді. Тарихтың айтуынша, өзгеріс ескіні қайта өңдеу сияқты, жаңаны енгізу болып табылады. Өткен уақыт болашақта көлік баламалары үшін маңызды ресурс болып қала береді.

Түйін сөздер: технологиялық инновация, модернизацияның баяулауы, көлік инфрақұрылымы, көлік саласындағы өзгерістердің салдары, жүйелердің интерактивтілігі, шамадан тыс жүктелген жүйелер, кептелістер, «ымырт» аймақтары, Ұлы Лондон түтіні.

БОКЕНКЫЗЫ А. – преподаватель (г. Алматы, Алматинский технико-экономический колледж путей сообщения)

ИСТОРИЯ ТРАНСПОРТНОЙ СИСТЕМЫ ВЕЛИКОБРИТАНИИ

Аннотация

Цель этой статьи – обобщить основные изменения, затронувшие транспортные системы Великобритании за последние 100 лет.

В первом разделе указаны важные моменты изменения основных видов транспорта. Во втором разделе рассматриваются основные факторы, объясняющие эти изменения. В третьем разделе рассматриваются последствия для экономики, социального неравенства и окружающей среды. В статье также упоминаются общие тенденции и вопросы для рассмотрения. На основе исторического анализа были определены пять вопросов, имеющих отношение к будущему транспорта в Великобритании.

Интерактивность: хотя транспортный анализ и политика часто ориентированы на отдельные виды транспорта (например, автомобильный, железнодорожный), очевидно, что развитие некоторых видов транспорта было тесно связано с развитием других видов транспорта. Большинство путешествий в прошлом были мультимодальными.

Революция мобильности: данные указывают на трансформацию личной мобильности в конце двадцатого века, обусловленную потребительским спросом. Масштабы и масштабы трансформации произошли в автомобильном, воздушном и, в последнее время, железнодорожном транспорте.

Перегрузка: одним из результатов резкого увеличения движения людей и товаров стала перегрузка транспортных систем: перегруженные дороги, переполненные поезда и аэропорты. **Устойчивость:** после нефтяного кризиса 1973 года устойчивость транспорта была серьезной проблемой, включая возобновляемые ресурсы, выбросы

углерода и загрязнение. Правительство работает над повышением устойчивости, но это остается серьезной проблемой.

Альтернативы: транспортные системы были относительно стабильными в течение последнего столетия, что позволяет утверждать идею неизбежного прорыва к новому этапу развития транспорта. История подсказывает, что изменение – это вопрос повторного использования старого и внедрения нового. Таким образом, прошлое остается важным источником транспортных альтернатив в будущем.

Ключевые слова: технологические инновации, медленная модернизация, транспортная инфраструктура, последствия изменений на транспорте, интерактивность систем, перегруженные системы, дорожные заторы, «сумеречные» районы, Великий Лондонский смог.

УДК 656.254.1

ТАИРОВ Ж.Л. – ст. преподаватель (г. Алматы, Казахский университет путей сообщения)

КАЛИЕВА А.А. – магистр (г. Актобе, Актюбинский университет им. С.Баишева)

КУРАКБАЙ М.Б. – магистр (г. Актобе, Актюбинский университет им. С.Баишева)

АВТОМАТИЗАЦИЯ ПРОЦЕССОВ КОНТРОЛЯ КАЧЕСТВЕННЫХ ПОКАЗАТЕЛЕЙ РАБОТЫ СЕТИ СВЯЗИ

Аннотация

Современное развитие систем и средств телекоммуникаций, а также расширение спектра предоставляемых ими услуг предъявляет все более высокие требования к качеству услуг, что немисливо без обеспечения должного качества систем и сетей электросвязи. В данной работе рассматривается возможность автоматизации процессов контроля качественных показателей работы сети связи.

Исследовали статистическую оценку качества за каждый месяц и за весь измеряемый период. Качество обслуживания может отражаться как качественными, так и количественными характеристиками. Для контроля качества предоставления услуги качество обслуживания отражается количественными характеристиками – показателями качества для структурных подразделений и элементов сети.

Ключевые слова: распределенные системы, управление сетями, голосовой трафик, учет и хранение информации, сетевая служба, операционные системы, сетевые параметры, оптимальные алгоритмы управления, скорости передачи информации, модернизации систем связи, коммутационная аппаратура.

Введение.

Современное развитие систем и средств телекоммуникаций, а также расширение спектра предоставляемых ими услуг предъявляет все более высокие требования к качеству услуг, что немисливо без обеспечения должного качества систем и сетей электросвязи. Модернизация городских телефонных сетей (ГТС) при внедрении цифрового коммутационного оборудования основано, как правило, на следующих принципах:

- аналоговые ГТС классифицируются по принципам реализации их структуры;