

Wartime Logistics and the Provisional Government

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For all the decades of reformist and revolutionary opposition, ultimately Russia's wartime economic crisis brought down the Tsarist autocracy.¹ The story is familiar. Severe economic difficulties helped to produce military and political crises by summer 1915. In the empire's western borderlands, the war's so-called Eastern Front was stabilised by the autumn, but in the rear the interrelated economic and political crises became ever more acute. Much of the problem, it seemed, was logistical: fuel, food and raw materials existed, but could not be transported to where they were needed. Indeed, the doyen of Soviet historians of Russia's wartime economy, A.L. Sidorov, concluded that the inadequate and poorly managed railway system became the Achilles' Heel of Tsarist capitalism.² In February 1917 the shortages of increasingly expensive food and fuel in the capital, Petrograd, sparked demonstrations and strikes. When garrison troops¹ mutinied rather than shoot demonstrators, riots turned to revolution.³

The men who constituted the resultant Provisional government knew from their predecessor's fate that they needed at least to alleviate the economic crisis. Again, the subsequent story is familiar. Popular enthusiasm for the revolution did not translate into a concerted national struggle for economic recovery. Production slumped, shortages worsened, prices rose and strikes proliferated. By the time that the Bolsheviks seized power in the autumn, the economy was in a far worse condition than in February.⁴ And at the epicentre of this collapse was a deepening transport crisis. So, what went wrong on the logistical front for Russia's would-be saviours? This chapter explores how ministers understood the problem, how they addressed it, and why their efforts ultimately failed.⁵

The Wartime Politics of Logistics

In theory the first Provisional government was well equipped to tackle the economic crisis. The holders of the four key economic portfolios had considerable pertinent experience. The new Minister of Trade and Industry, A.I. Konovalov, was a textiles industrialist who had served as a deputy chair of the Central War Industries Committee from 1915 and as chair of the Moscow regional War Industries Committee. The Minister of Finances, M.I. Tereshchenko, was also a deputy chair of the Central War Industries Committee and additionally chaired the Kiev region's War Industries Committee. A.I. Shingarev took charge of the Ministry of Agriculture thanks to his long service in the State Duma's budget, agriculture and food committees, and his co-

authorship of the agrarian programme of the centre-left Constitutional Democratic (Kadet) Party. Finally, the new Minister of Ways of Communication, N.V. Nekrasov, had trained as a transport engineer, and was deputy chair of the State Duma throughout Tsarism's last winter.⁶

As State Duma deputies and senior members of the Kadet Party, these men were all prominent long-time liberal opponents of the Tsarist autocracy who nonetheless supported the war effort. In summer 1914 their party presented itself as a patriotic loyal opposition, intent on criticising government errors and inefficiencies constructively in the interests of victory. By spring 1915, however, the Kadets believed that the regime was badly mismanaging the war effort. Some Kadets like Konovalov and Tereshchenko therefore collaborated with other non-state actors in creating so-called war industries committees.⁷ But whereas this initiative was presented as helping the state, by August 1915 the Kadet Party among others was demanding a government of "popular confidence". In truth, the Kadets wanted a constitutional monarchy – a revolutionary demand. After the Tsar had dismissed this pressure, the Kadets became increasingly outspoken. By November 1916, when party leader P.N. Miliukov denounced the government in his notorious 'stupidity or treason?' speech to the Duma, their stance was effectively that victory in the war required a change of government.⁸

The intimate connection between this political context and the war economy is reflected in the Kadets' perception of the logistical problems. Essentially, they believed that the transport system was ill prepared for the war's demands and poorly exploited during the war. For them, Tsarism's peacetime transport legacy was a badly managed and increasingly expensive service, with inadequate capacity due to years of underinvestment. For the war years the Kadet narrative again emphasised poor management – from the Ministry of Ways of Communication (*Ministerstvo putei soobshcheniia* – MPS) and individual railway and shipping companies to junior officials such as station masters. For example, they believed that the MPS was neglecting waterways for relieving pressure on the railways, and that the wartime emergency investment was insufficient and too slow in yielding the essential returns. Not least, the Kadets regarded minister S.V. Rukhlov (to October 1915) and his successor A.F. Trepov (to December 1916) as political reactionaries. Better leadership, better management and more resources were essential for resolving the transport crisis.⁹

Historians, however, have yet to test this argument rigorously. A key reason is the high politics of blame. By 1916 the transport sector was being criticised openly by officials in the Ministry of War, Ministry of Trade and Industry, Ministry of Agriculture and other major state and public institutions, none of whom wanted the blame for the war crisis.¹⁰ The MPS could rally only a few defenders.¹¹ Importantly, for reasons of military secrecy it could not issue detailed explanations. Following the Tsarist regime's demise, the critique was reiterated by Provisional government officials, émigré writers, Bolshevik leaders and Soviet historians alike. For example, in emigration the former chair of the State Duma M. V. Rodzianko was strident in his memoirs. Within Soviet Russia the highly respected non-Bolshevik engineer V.I. Grinevetskii was likewise damning; his 1919 book about industrial strategy for revolutionary

Russia was treated by Lenin and his colleagues as both vindication and guide.¹² Since then, the few detailed historical treatments have never really acknowledged that so many of the transport industry's critics had a vested interest in avoiding blame, seeking regime change or denigrating their predecessors.¹³

Because the contemporary critique still shapes our understanding of the wartime supply crisis, the assertion that the inadequate and decrepit transport system collapsed during the war remains a staple feature of essays about the February Revolution. Yet there are significant grounds for questioning it, as J.N. Westwood suspected back in 1990.¹⁴ In the next section, that suspicion is confirmed through a brief analysis of three major issues – pre-war investment, waterway freight traffic and railway freight traffic.

Questioning the Contemporary Criticism

No transport system in any of the major belligerent countries was remotely ready for the actual shipment demands of 1914–18. Because military planners across Europe assumed that the next war would be short, their logistical investment priorities were concentrated on mobilisation.¹⁵ But even if they had foreseen the actual chronic pressures of 1914–18, the cost of comprehensive preparations would have been prohibitive. This point applies even for Germany, reputedly well prepared. Famously fearful of a war on two fronts, the German High Command did anticipate the need to move their armies rapidly across their country. Fast east-west transit routes were a basic necessity for them. Yet in 1914 the capital Berlin remained a bottleneck for transit traffic: it still lacked an orbital railway for bypassing the city centre.¹⁶

Evaluated in this context, the traditional picture of Russian government parsimony and neglect concerning strategic railway investment is a caricature. Always difficult, the financial climate in late imperial Russia was especially tough after the expensive Russo-Japanese War of 1904–05. The regime could not spend with abandon if it wished to rebuild and maintain domestic and foreign confidence in the state finances and economy. The Ministry of Finances certainly embraced this logic, and importantly, the new State Duma also played a big role in restraining government expenditure. Not least, the Duma constantly pressured the government to reduce railway-related state debt and costs. For example, in spring 1914 its budget committee imposed a 50 per cent cut on an MPS plan for 16,700 new freight wagons for the state railways in order to save some 11 million roubles.¹⁷ From the perspective of the MPS, the creation of the State Duma made the process of getting investment approval slower and harder.¹⁸ It was thus inevitable in Russia as in the other major belligerent countries that the demand for transport in a long-term European war would greatly exceed the available capacity. Then the question would be how to deal with the shortfall. And in this light one can begin to see why wartime criticism from Duma

deputies about locomotive and wagon shortages might strike senior MPS officials as political hypocrisy.

The second example concerns the wartime usage of inland waterways.¹⁹ Water transport was potentially an important means for relieving pressure on the railways, but was not a simple option. It was best suited for bulk shipments of non-perishable cargos like fuel, ores and grain. But even with these goods, multiple variables had to be considered, each of which was problematic to a greater or lesser extent: the locations of the waterways; their suitability for navigation; the length of the so-called navigation season (determined mainly by winter ice); the availability of vessels, docks and labour; the consignment demand (type of freight, urgency, destination, etc); and the relative costs of water and any alternatives. Unhelpfully, the waterways were often poorly located for the needs of shippers and/or recipients, and on most routes year-round freight flows could not be organised due to ice. Frequently, such constraints meant that a given consignment required at least one trans-shipment between rail and water. Yet these transfers were usually not mechanised, and hence were time-consuming, labour-intensive and required large amounts of warehousing or space for open storage.

Because waterway tariffs could be cheaper than rail, shippers often chose them to move non-urgent freights. For instance, the Nobel Brothers oil company invested in not just rail tanker wagons, but also ships, barges and dock facilities to move their oil products from the Caucasus across the Caspian Sea and up the river Volga to such places as Tsaritsyn (later Stalingrad, now Volgograd) and Saratov for onward transport by rail or water.²⁰ In wartime Russia, however, with the much higher overall demand for capacity and greater urgency for delivery, the constraints made themselves felt more keenly. For instance, vessel and labour shortages were constant problems, and dock handling and storage facilities were often inadequate for the large previously unforeseen flows of goods. Navy requisitions of vessels discouraged shipping companies from trying to buy replacements. Accordingly, a rail-water transport solution for a given freight demand was not necessarily the best way to relieve pressure on the railways.

How well the waterways were used during the war is an important question that still requires detailed research. For present purposes the pertinent point is that even if they did not exploit every opportunity, the Tsarist authorities did take this issue seriously. Vessel flotillas operated on each major water system, and traffic was planned in much the same way as for the railways. Thus, for instance, the river Northern Dvina and its canal connections to the Petrograd area were used from summer 1914 to relieve pressure on the Archangel-Vologda-Petrograd railway route, primarily by moving imported coal for the Baltic Fleet – 28 million puds in 1916. Problems included a shortage of suitable vessels, and insufficient warehousing at Kotlas for trans-shipments with the Kotlas-Viatka railway, which served as another means to bypass the Archangel-Vologda railway bottleneck.²¹ Further south, from spring 1915 Donbass coal was sent by rail to Sarepta near Tsaritsyn for delivery to Petrograd and the north west via the Volga and Mariinskii canal system. This circuitous, slow route was also problematic in terms of vessel availability, but was crucial for easing the intense pressure on Moscow's rail network: some 35

million puds of coal were shipped in 1916.²² Similarly, the Caspian Sea and river Volga were used for moving most of the oil products manufactured in the Caucasus.²³ In the Far East the authorities became so desperate to clear imported goods from Vladivostok port that in early 1916 they began sending freights by rail and sea north to the Amur river for westward movement by barge to Sretensk, where they would be reloaded onto trains.²⁴

The final example is railway freight operations. Recent research has challenged the established opinion that traffic was disorganised by winter 1915/16 and began to collapse during the following summer.²⁵ Measured with a statistic known as pud-versts, the railways actually transported about 20 per cent more freight in the calendar year 1916 than in their record peacetime year (1913), having already exceeded their 1913 result by about 10 per cent in 1915.²⁶ True, the monthly pud-verst figures for the fourth quarter of 1916 have yet to be found in the archives, but since the monthly results up to 30 September 1916 exceeded those for 1915 by roughly 10 per cent, any slump relative to 1915 that may have occurred during the final quarter cannot have been large. It stands to reason that this record result could not have been achieved amid widespread disorganisation. There was surely scope for better organisation, but the real problem was that not even these record performances could cover the overall demand.

Table 1 **Wagons loaded (excluding tankers) on Russia’s Railway Network, January-February 1916 and January-February 1917**

| | 1916 | 1917 | |
|----------------|---------------|---------------|---------------------|
| | Wagons loaded | Wagons loaded | % of the 1916 level |
| January 1–14 | 504,725 | 471,907 | 93.5 |
| January 15–31 | 533,356 | 431,605 | 80.9 |
| February 1–14 | 510,611 | 397,842 | 77.9 |
| February 15–28 | 464,819 | 412,255 | 88.7 |

Source: MPS Directorate of Railways Operations Department to Provisional government, June 1917, calculated from attached charts 1 and 2 (RGIA f. 273, op. 10, d. 3677, ll. 35–36).

The picture for January and February 1917 is less clear for want of network pud-verst statistics, but certainly a catastrophic collapse did not occur. New disruptive variables were exceptionally bad weather from mid-January (until mid-March), poor quality locomotive fuel, and consequent locomotive failures, which in turn proved hard to resolve because of shortages of metals and skilled maintenance staff.²⁷ The quantities of wagons loaded were well below the record amounts of January-February 1916 (Table 1), but these results must still be regarded as substantial given the atrocious circumstances and the record-breaking nature of the 1916 full-year performance. Furthermore, Petrograd and Moscow had enjoyed the top priority for civilian shipments of food and fuel throughout the war, and now their trains had the highest priority after military shipments. ‘First necessity’ goods did continue moving to the two capitals despite the new obstacles.²⁸ In other words, the February revolution erupted in a city that was better placed

in terms of food and fuel deliveries than any other town or city in the empire bar perhaps Moscow.

The above remarks do not mean that criticisms of the transport sector's pre-war infrastructure and equipment legacy are unfounded, that managerial problems were marginal, or that the wartime transport difficulties were insignificant. The notion of a transport crisis during the winter of 1916/17 may indeed be correct; the difficulties with locomotive overhauls may well mark a decisive challenge, threatening decline and demanding attention after some 30 months of reduced maintenance. But the point here is that if the Provisional government hoped to solve the sector's difficulties, the ministers needed to understand clearly what that problem was. Yet the above examples reinforce Westwood's doubts about their understanding of this industry as inadequate and badly managed, and as collapsing from summer 1916. And as the next section will show, there were also other problems that attracted less attention at the time but which with hindsight can be seen to have posed critical challenges.

Rethinking the Logistical Challenge

The initial logistical priority when the war broke out was to accommodate the military mobilisation.²⁹ The planning assumptions about commercial freight and passenger traffic were that services would be almost totally suspended for several weeks, and that demand and services would return gradually to more or less normal thereafter. In retrospect this thinking may seem naïve, but it was not unique to Russian planning. Britain's railways, for example, took much the same approach, and for the British government "business as usual" was a mantra until 1916.³⁰ The key point for present purposes is that while Russia's railways did cope successfully with the military's mobilisation demands, the suspension of most commercial freight services for some eight summer weeks badly disrupted the annual process of stockpiling food and fuel in urban areas for winter use. In fact, this problem points to a new explanation for the capital's 'first necessity' shortages in February 1917. Severe disruption to the stockpiling process recurred in summer 1915, now owing to ramifications of the Great Retreat. Then it happened again in August–October 1916, probably mostly because of new traffic arising from Romania's military collapse. Yet the tsarist regime failed to dampen demand for food and fuel by introducing systematic rationing. Petrograd's fateful shortages, then, may well have been caused mainly by events and policies outside transport managers' control.³¹ The major practical implication for the Provisional government was that large reserves of food and fuel had to be stockpiled for Petrograd (and other urban areas) by October 1917 without fail. But that target required far higher delivery rates than had been recorded in the war thus far – a daunting challenge even in ideal circumstances, let alone amid revolutionary turmoil.

These troubles, however, were almost unimaginable as the railways began restoring commercial traffic in the late summer and early autumn of 1914. Nonetheless, “business as usual” would never be the norm on Russia’s wartime transport system. Freight logistics were dominated by profound changes in demand and goods flows. Here, distinctions must be made between new demands and flows that stemmed directly and indirectly from the need to maintain the army in the field and the navy in steam; on-going demands and flows from the pre-war period; and pre-existing demands and flows that decreased dramatically or stopped. There were massive new long-term military demands, mostly in new directions, plus new demands for certain essential civilian flows. Primarily this meant westbound flows of arms, munitions, food, fuel and many other supplies to the empire’s western borderlands; a similar if much smaller southbound flow to the Caucasus Front; a southbound flow from Archangel of British coal for the Baltic Fleet and of other imported military supplies; westbound military and other imports from Vladivostok; and a northbound flow of Donbass coal to Petrograd and north-western provinces hitherto reliant on imports. Importantly, most pre-war demands persisted, and only a few shrank dramatically, notably export shipments of dairy products and grains. Overall, therefore, demand far exceeded the available capacity.

Obviously, this unprecedented situation could not, and did not, continue for long without threatening dangerous consequences. Newspapers across the political spectrum began reporting about price inflation and shortages of food and fuel products in Petrograd during autumn 1914, and the word ‘crisis’ became well established in the press during spring 1915.³² The Tsarist authorities’ numerous and multi-faceted responses cannot be detailed and evaluated here, but two observations about wartime freight logistics are useful for elucidating the complex challenge that the Provisional government would face.

The first is that the Tsarist government made little attempt to dampen public and military expectations about access to transport capacity. There was no information campaign, and no rationing to curb civilian demand. The inter-ministry committees that planned the freight flows gave first priority to almost every military demand. There was scarcely any discussion of the relative importance of military and civilian consignments on congested routes.³³ In 1915 the MPS did devise a procedure for defining the dispatch priority of each consignment presented for railway shipment.³⁴ This measure all but closed the network to long-distance movements of low priority goods, yet this implication was never publicised. Hence, civilian shippers continued to expect access, and when they were refused, the consequences were frustration, recriminations and efforts to circumvent the restrictions, including corruption.³⁵ As for alternative policies, at least three things could have been done differently for potentially significant improvements. One was to manage public expectations. The second was explicitly to ration transport capacity. The third was to create a mechanism fully independent of the Ministry of War for strategic evaluation of all demands for resources, including transport capacity, preventing the military demands from crippling the economy. But these options were not pursued.

The second observation is the centrality of the Russo-Ottoman conflict.³⁶ Typically viewed by the Russian army command as a ‘sideshow’, this war had profound logistical implications. It involved a tight enemy blockade of European Russia’s southern ports through the closure of the Turkish Straits, and a major Russian land and sea effort for supplying the Caucasus Front. The Ottoman blockade, coupled with the mining of the Danish Straits, meant that Russia had to rely on just Archangel and Vladivostok ports for its imports of military supplies, which were considerable.³⁷ Both ports were distant from the empire’s battlefields, and their rail connections had not been designed for massive amounts of imports. Among the most important consequences was severe pressure on the two routes across the Urals between Siberia and European Russia. Their combined daily capacity in each direction was only 750 wagons – far less than the military demand, let alone any civilian needs – and this capacity could not be expanded quickly. This bottleneck was kept secret even from Allied governments. Thus, while critics of the MPS pointed to vast stores of food in Siberia, the reality was that those products could be moved into European Russia only at the expense of urgent military traffic. Similarly, as noted above, the military demand on the trunk railway through the Caucasus forced the authorities to send most of Russia’s oil products via the Caspian Sea and river Volga, even though this route was unusable during winter. In short, much of the strain on the transport system was a direct product of the Russo-Ottoman war. Like Germany, Russia was fighting a war on two separate fronts in conditions of near total enemy blockade.

Acutely aware of these logistical connections, MPS officials kept a hopeful eye on the Allies’ ill-fated Gallipoli campaign.³⁸ But whether the government and military leaders ever discussed these particular consequences, especially after the withdrawal from Gallipoli, is unknown. Nor is it known whether ministers Rukhlov and Trepov reported them formally to the Tsar, because most of their frequent wartime typed reports to the sovereign have not survived. Most likely, the ministers said nothing. They and senior MPS officials displayed a deferential attitude towards the state’s war policy and the transport needs of the armed forces as defined by the latter. On the rare occasions that they did raise broad questions, they backed down at the first hint of resistance. For instance, in January 1915 the Head of the MPS Directorate of Railways urged the army to reduce its demand for westbound shipments of Siberian oats temporarily by using oats stored in European Russia, but he was immediately rebuffed, and dropped the matter.³⁹ Whatever was or was not said, the Ottoman war continued to dislocate the transport system into 1917. Accordingly, the February Revolution offered, at least in principle, an opportunity for fresh strategic thinking.

The Provisional Government Takes Charge

The Turkish Straits did loom large in the Provisional government's short life, but not in any way helpful for improving the transport situation, for the idea of a separate peace with Constantinople conflicted with powerful political and alliance pressures. For centuries Russian nationalists had longed to control Constantinople and the Straits for reasons of Orthodox culture and security.⁴⁰ In March 1917 Kadet leader Miliukov became the champion of this dream as the new Minister of Foreign Affairs. He argued against giving the British and French governments any excuse to break their 1915 consent for this Russian control in the event of Allied victory. But fundamental to the Franco-Russo-British alliance was an agreement never to negotiate a separate peace, and the western Allies opposed an exclusive treaty with the Ottoman empire for fear of Russia quitting the struggle in Europe. Hence, despite the public clamour for peace, the Cabinet accepted that Russia had to continue fighting. Within just a few weeks that policy caused a public outcry, Miliukov's downfall and a Cabinet reshuffle. Even so, the replacement Cabinet was also committed to the war.⁴¹ Ironically, therefore, the Russo-Ottoman conflict would continue until 1918 to cause precisely the devastating economic consequences that Russian control of the Straits was intended to prevent.

Furthermore, the war's continuation generated an unforeseen new danger for the railway system. In late March large mobs of army deserters began seizing control of trains. Locomotive crews were forced at gunpoint to take their train into a single-track section even if station personnel knew that, for instance, the track was occupied by an oncoming train, blocked by late snow or washed out by that spring's extensive flooding. The rampaging soldiers simply ignored these dangers, and killed at least one station master. Efforts by the railway and military authorities to prevent these hijacks proved fruitless, and this anarchy continued to cause yet more delays to vital freight shipments.⁴²

The army was in fact quick to bring the economy to the new government's attention. On 9 March the acting Commander-in-Chief, General M.V. Alekseev, wrote to the head of the government, Prince G.E. L'vov, proposing an urgent conference at Stavka, the army's headquarters at Mogilev. Alekseev wanted front army representatives to meet with ministers to discuss what the army needed, how far the country could meet those needs, and how to reduce the military's requirements. L'vov designated 18 March as the day.⁴³ However, the conference actually occurred on 30 March because the front staffs failed to supply the necessary information in time. This postponement became significant in the sense that the USA's entry into the war on 24 March opened the possibility of a large American state loan for importing more war supplies, and in turn that opportunity influenced the discussion about transport.

The attendance list augured well for achieving important decisions. Chaired by L'vov himself, the conference was attended by the ministers of war (A.I. Guchkov), agriculture (Shingarev) and foreign affairs (Miliukov), deputy ministers and senior officials from the MPS, Ministry of Trade and Industry and Ministry of Internal Affairs, a large delegation from the War Ministry, and a host of Stavka-based military and civilian officials. Representing ministers Kononov and Nekrasov were their deputies P.A. Pal'chinskii and D.A. Ustrugov respectively,

and the deputy head of the MPS based at Stavka, General V.N. Kisliakov, also attended. A notable absentee was the Minister of Finances, Tereshchenko.⁴⁴

Alekseev's three questions – especially the one about reducing the military's requirements – offered the government a chance to propose a new philosophy for managing the war effort that aligned military plans with economic capacity. But that opportunity was spurned. There was no fundamental reassessment of the military's aims and requirements, nor were alliance commitments mentioned except in relation to Romania; the very full record shows that Foreign Minister Miliukov said almost nothing. Instead, the discussion was framed very narrowly, and L'vov acted merely as a conciliator, not as a leader with a vision of how to do things differently. No major decisions were taken. The outcome, in essence, was continuity with the old regime's conception of how to run the war effort.

Specifically, the reduction of the army's requirements became the question of how much the front-zone ration commitment could be reduced. Haggling over relatively small numbers dominated the discussion. Summarised crudely, the army representatives sought a limited reduction consistent with the maximum amount of food that reportedly the railways could deliver, whereas Shingarev in particular – by far the most vocal civilian participant – probed and questioned their assumptions and data, seeking a larger reduction. The question of how the affected people – potentially including the families of front-zone railway personnel – would feed themselves was scarcely addressed. Eventually L'vov brought the debate to an inconclusive close by proposing that a decision be negotiated and finalised within two weeks.

The second issue actually discussed was how to reduce the strain on the railways. Crucially, there was no broad debate about rationing access to transport and achieving a more balanced means of prioritising military and civilian demands. Greater use of waterways, top priority for locomotive heavy overhauls and urgent efforts to expedite deliveries of new locomotives and rolling stock were the main measures considered. L'vov deduced, ominously, that there was no hope for any improvement in shipments during April–June. The discussion concluded with general agreement that 'the question of getting rolling stock from America in Vladivostok was the most fundamental need in relation to the improvement of transport'. After that, Pal'chinskii delivered a report about metals and fuel, but there was little appetite for discussing it, whereupon L'vov closed the meeting.

The conclusion about American rolling stock is remarkable and puzzling. This policy could be considered only because the USA had joined the war: a belligerent government could not borrow from a neutral government, Russia had thus been dependent on the British government for financing war-related overseas procurement since 1914, and in 1916 the latter had imposed a moratorium on new Russian contracts for American railway equipment. Furthermore, there was almost no practical chance of any deliveries from America in 1917, as recent experience showed. When in spring 1915 the Tsarist government had decided to order 400 locomotives in North America for urgent delivery, for a host of practical reasons these

locomotives did not begin arriving at Vladivostok until late 1915, and then required reassembly at Harbin.⁴⁵ Now at least five times that number were wanted – an unprecedented quantity in the global history of locomotive exports – and Washington had yet to confirm a big loan. There was no reason to suppose that the delivery time could be substantially quicker even if, as the Russians hoped, the US government prioritised this support. Either the conference participants were deluding themselves about the procurement schedule, or they had abandoned hope for a fundamental improvement in transport during the remainder of 1917. The latter scenario was presumably their actual thinking, but it implied little if any opportunity for food and fuel stockpiling for the next winter. Were the new ministers perhaps distracted by the possibility of a big American loan? Or were they already resigned to mere damage limitation and a hungry, rebellious winter?

The Provisional government did at least act promptly on the core proposals from the transport discussion. In mid-April it passed a law compelling the maximum use of inland waterways during the 1917 navigation. Key clauses included a ban on using railway transport for any goods that could make the whole journey by water, and higher dispatch priority for goods forced to go by water.⁴⁶ However, some of the resultant instructions to the heads of railway companies and the chairs of the regional freight traffic committees merely confirmed work that was already being done, such as routing imported coal via the Northern Dvina and Sukhona rivers to Vologda. Importantly, MPS officials cautioned that time was needed to agree contracts with shipping companies, prepare storage space and create teams of freight handlers (*gruzchiki*).⁴⁷ In other words, the authorities were tackling obstacles that they had earlier treated as deterrents because of the considerable time and resources needed to resolve them. Crucially, the government seemed to ignore the intractable question of how to find enough workers amid a severe labour shortage. Consequently, with shipping already beginning to move, this law was unlikely to deliver a meaningful difference during the 1917 navigation season.

As for railway investment, continuity was the reality for railway construction policy. During 1916 minister Trepov had initiated planning for a massive investment programme that looked ahead to post-war reconstruction.⁴⁸ Shaped in part by consultation with public organisations like the war industries committees, it was finalised at over 37,000 km of new routes for implementation during 1917–22. In the difficult circumstances it was an extremely ambitious echo of Count Sergei Witte's strategy in the 1890s to use railway building as a lever of industrialisation and economic modernisation. Given the public consultation and considerable effort expended, the Provisional government was unlikely to adopt a radically different policy. It simply continued to fund existing projects, and explored options for new finance that included foreign investment.⁴⁹

To procure transport equipment the government authorised enormous expenditure. Just two days after the Stavka conference, on 1 April, the Cabinet approved an MPS report about spending USD200 million on importing 2,000 locomotives and 40,000 freight wagons urgently from North America.⁵⁰ These quantities of equipment and money dwarfed the combined total of

the Tsarist government's already substantial emergency overseas contracts of 1914–16 for railway equipment.⁵¹ Additionally, big contracts were awarded to domestic suppliers, and as with the railway-building plan, the new government's decisions demonstrated an interest in post-war reconstruction. In particular, on 21 May the Cabinet authorised a five-year contract with the Kolomna machine-building company for delivery of 1,000 locomotives and 15,000 freight wagons during 1918–22. The same meeting also endorsed an even larger and longer deal with the Russian Company for Making Shells and Military Supplies, this time for 1,470 locomotives and 15,600 freight wagons by 1925.⁵² Long-term contracts of this ilk had been wanted by Russia's transport engineering companies since at least 1913, and by early 1915 the industry viewed them as vital for resolving wartime cash-flow problems and resource shortages.⁵³ The fact that the government brought a major armaments company into this arena in May 1917 indicates a strategic intention to increase production capacity in an industry that had been operating at well below capacity during 1908–13. Given also that wartime losses of railway equipment to date had been quite modest, it seems reasonable to deduce that the government anticipated a long-term post-war process of equipment development and modernisation to match the railway-building programme.⁵⁴

Yet none of these procurement decisions marked a revolutionary change in state policy. Back in spring 1916 the MPS had finalised a plan to import 1,300 locomotives, 34,915 wagons and over 126,000 tonnes of rail as well as other supplies from North America for nearly USD200 million. Unfortunately for the MPS, that plan depended on British funding, like so much of the Tsarist regime's wartime overseas procurement, and it fell because London balked at providing so much money for non-military products.⁵⁵ As for the domestic industry, the Tsarist authorities had conceded the principle of long-term contracts in March 1915, and by July 1916 the MPS had taken a firm decision to begin issuing long-term contracts to Russian factories to cover the needs of state-owned railways for the next 5–6 years.⁵⁶ In reality, then, the Provisional government was able to act so quickly because most of the preparatory work had already been done.

Above all, however, these equipment contracts could not possibly solve Russia's immediate logistical problems. As noted above, the American imports would not enter service in quantity before 1918. Similarly, the first deliveries on the domestic contracts were not due until 1918, and in any case the Russian factories still had to complete delayed locomotive and wagon orders from 1915 and 1916. In fact, Nekrasov and the Stavka conference really wanted the locomotive-builders to assist with heavy overhauls of existing locomotives. This tactic was sensible for expanding the operational stock, because locomotives fresh from heavy overhaul were the most likely to survive the next winter without breaking down. However, as the Bolsheviks would find when trying this same policy in 1920, the industry was resistant, preferring more lucrative contracts for military supplies and new engines.⁵⁷ Accordingly, with shortages of labour, materials and spare parts continuing to hamper repair work, the proportion of 'sick' locomotives climbed from around 16.8 per cent in January 1917 to 22.9 per cent in late

May.⁵⁸ By November and December the reported figures would be 27.4 and 29.4 per cent respectively.⁵⁹

Workers, Managers and the Railway Trade Union

Importantly, the US loan came with conditions. One was for the Russian government to facilitate a fact-finding tour by US railway engineers. The American side wanted to assess the situation for themselves. Naturally, MPS officials felt that their competence was being questioned, but they had to accede if they wanted the American equipment. The mission duly arrived at Vladivostok in late May, and its forthright chief, John F. Stevens, soon caught the local mood: '[The Russians] want us to put a big bag of money on their doorstep and then to run away'. Instead, estimating that the railways were working at only about 60 per cent capacity, the visitors concluded that poor labour discipline and productivity were the main difficulties. Workers seemed discontented, idle, insubordinate, apathetic and indifferent. A further explanation was poor traffic management. The Americans believed, for instance, that managers were allowing coal traffic needlessly to congest the trans-Siberian route near Tomsk.⁶⁰

Whether the Americans' technical analyses were sufficiently sympathetic to the local equipment, conditions and culture can be disputed, but their comments about the workforce were hard to dispute, and their overall diagnosis cannot have surprised Nekrasov. Railway workers had achieved political notoriety when their October 1905 strike developed into the empire's first general strike. In the aftermath, the Tsarist regime was determined to prevent any future disruption to transport services, for political and military as well as economic reasons. Its response relied heavily on repressive and coercive measures, including dismissal of some 60,000 staff during 1905–07 for revolutionary activity. It outlawed union membership and strikes, created special central and local security committees to enforce discipline, and passed legislation to subject employees to a form of semi-military discipline in wartime. Full militarisation of the industry was considered, but ultimately not pursued.⁶¹ During the World War, the ministers tried to defuse worker discontent with modest efforts to improve the material situation of staff, especially lower paid personnel.⁶² As for railway management, Nekrasov among other Duma representatives had been complaining about it for years, as noted above. So, how did the Provisional government try to deal with these issues?

Unsurprisingly, appeals to transport workers to work normally were among Nekrasov's first actions as minister.⁶³ There had been similar appeals by previous ministers, and there would be more by Nekrasov and his three successors before the October revolution. But generally the Provisional government did steer a different course from its predecessor concerning labour policy. Some of the changes and proposed changes were not specific to the transport sector, such as the legalisation of trade unions, the introduction of an 8-hour working day, the abolition of

piece-work and improvements to the rights of women employed in the state sector. The material situation of railway personnel was investigated by a commission led by the veteran revolutionary socialist G.V. Plekhanov.⁶⁴ A landmark change was the abolition on 7 March of political restrictions on hiring transport staff.⁶⁵ However, the decisive labour development for the industry proved to be unionisation. In particular, the large union that emerged on the railways had a powerful and ultimately notorious leadership called the All-Russian Executive Committee of the Railway Union (*Vserossiiskii ispolnitel'nyi komitet zheleznodorozhnogo profsoiuza – Vikzhel*).⁶⁶

Disruptive for the economy as unionisation proved to be, the government had little if any choice about allowing it for transport workers. Powerful pressures were the explosion of union-building in the society and the memory of 1905. But Nekrasov, on the left of his party, actually embraced it. On 27 May, following the union's first conference, he issued MPS circular 6231 about the democratisation of railway management.⁶⁷ He began by observing that Tsarist management had been founded on administrative repressions, the oppression of the personality of railway personnel and the elimination of their initiative concerning their duties. This approach, he continued, was completely at odds with the principles of rights, justice and political freedom. Instead, 'the organisation of correct and safe railway traffic and the establishment of a strict culture (*poriadok*) of railway employment had to be based on the friendly cooperation of managers and workers, the full equality of rights of all people working on the railways, the conscientious attitude of staff to their job, and the firm internal discipline that knitted the railway army into a single powerful force'. This discipline had to come not from fear of repression but 'from an understanding that the proper operation of the railway network was exceptionally important for the people and the state'. That result could be achieved only if all personnel were united in a powerful single professional union. Nekrasov explained that such a union was now being created, its constituent congress would occur soon, and union committees already existed at railway and district levels. And so by agreement with the union's executive committee Nekrasov now wanted to elaborate some interim basic principles for the joint work of railway management and railway union. The final version was to be based on the decisions of the union's constituent congress. The remainder of the circular elaborated Nekrasov's view of how the relationship would work. For instance, it allowed the union to monitor railway operating, and included information about staff secondments for union work, union access to the railway telegraph, and free travel for union officials.

Whether Nekrasov's policy was naïve, idealistic or pragmatic can be debated. Indisputable is the fact that it failed spectacularly, and helps explain the pronounced decline in transport productivity and labour discipline over the next five months. Scarcely consulted beforehand, managers were appalled.⁶⁸ For their part, union officials acted quickly to make their presence felt. For example, they intervened in hiring decisions and pressed for the dismissal of particular managers. Instead of friendly collaboration, the union-management relationship became tense and adversarial. At the same time severe tensions developed between Vikzhel and

the union's line committees, with the latter threatening strikes for improved pay and conditions, which the central committee could not deliver. These multiple tendencies became extreme by the autumn. There was a national railway strike in September, coinciding with the peak demand for harvest shipments. Then in October Vikzhel urged prime minister A.F. Kerensky to dismiss the minister himself.⁶⁹

By that time the minister was A.V. Liverovskii, the fourth holder of the post since the February revolution (Table 2). If better leadership had been a demand of opposition deputies in the State Duma, the Provisional government cannot be said to have provided it, even though all four ministers were experienced transport engineers. Nekrasov held the job for the longest time, but that meant just four months. He became deputy prime minister during the July Days. G.V. Takhtamyshev was merely a caretaker figure whose own year reflected deepening chaos. Having worked abroad for many years, he had returned to Russia in spring 1917 and was appointed as an MPS Inspector from 8 May. Two weeks later he was promoted to Chief Inspector, then in mid-June he became a deputy minister; he returned to this position after his fortnight at the helm. The next minister, P.P. Iurenev, was a long-standing Kadet who had worked with the Zemgor army supply organisation from 1915. Unlike Nekrasov, he opposed Vikzhel's interventionism and workers' wage demands. However, his refusal to support Kerensky in the so-called Kornilov affair led to his departure. Liverovskii was an MPS insider, having headed the Directorate for Railway Construction since 1915. From March 1917 he combined the role of deputy minister with membership of the council of the engineers' professional union. He did oppose Kornilov, but his brief ministerial career ended with his arrest during the night of 25/26 October 1917.⁷⁰

Table 2 Ministers of Ways of Communication under the Provisional government, 1917

| | From | To | Post | Politics | Education |
|--------------------|-------------|-----------|-------------|-----------------|-----------------------------------|
| Nekrasov, N.V. | 2 March | 4 July | Minister | Kadet | Engineer of ways of communication |
| Takhtamyshev, G.S. | 11 July | 24 July | Acting head | | Engineer of ways of communication |
| Iurenev, P.V. | 24 July | 31 Aug | Minister | Kadet | Engineer of ways of communication |
| Liverovskii, A.V. | 25 Sept | 25 Oct | Minister | | Engineer of ways of communication |
| | | | | | |

Source: Zakrevskaia and Gol'ianov, *Rukovoditeli vedomstva putei soobshcheniia*, 41–44. Other sources list Nekrasov's final day as 2 July. This source incorrectly gives Takhtamyshev's final day as 24 August.

Administrative Culture and Structures

In this fluid context, the Provisional government was unlikely to achieve much progress with improving transport administration and management. Criticism was an easy path for opposition politicians and foreign advisors, but for this would-be democratic government suddenly to transform a long-established management culture and bureaucracy was, realistically, impossible. The same aim would prove difficult even for the Bolsheviks despite their ruthless determination to retain power. Managers could be sacked – many transport officials were dismissed during spring 1917 and beyond – but their replacements had to come from the same professional milieu.⁷¹ This situation foreshadowed the Bolshevik government's reliance on so-called 'bourgeois specialists' until a new generation of politically reliable 'red specialists' was ready to replace them.⁷²

Unsurprisingly, then, neither the Provisional Government nor the MPS got far with reforming the culture of the transport bureaucracy. Early in his tenure Nekrasov initiated preparations for far-reaching decentralisation of management.⁷³ His concept was to extend the power of the company managers over day-to-day decision-making and to refocus the Directorate of Railways on strategic issues. But with his departure in July the initiative appears to have been abandoned. Importantly, no major changes were made to the regime of daily, weekly, monthly, quarterly and annual reports that defined much of the routine administrative and managerial activity. The one noteworthy difference was that the MPS had to submit its funding requests to the Cabinet instead of the State Duma, and the Cabinet instead of the Tsar made the final decision. However, this was hardly a change of substance, nor was it specific to the transport sector. Ironically for a government rooted in the State Duma, the new mechanism was very similar to the old regime's use of article 87 of the 1906 Fundamental Law, whereby ministries could ask the Council of Ministers and Tsar for funding approval without reference to the State Duma. This tactic had been used by the old regime for the majority of wartime funding decisions.

Reform of administrative structures offered some scope for improving management, but this opportunity was largely ignored. The main changes implemented had the effect of weakening the state's ability to control the workforce. The first – the abolition of the railway gendarmerie – was confirmed at only the third meeting of the Provisional government ministers.⁷⁴ An important coercive tool for the Tsarist regime, this special corps had no more chance of surviving in the revolutionary era than the hated Okhrana secret police. A related decision was the abolition of the central MPS security committee whose remit was to suppress transport strikes and disturbances; the subordinate committees on each railway were also abolished.⁷⁵ Yet it might be argued that the gendarmes did not really disappear, in the sense that a railway guard force (*strazha*) was created in their place by June 1917.⁷⁶ The parallel creation of a railway militia may also have reinforced feelings of *déjà vu* among railway personnel.⁷⁷

Aside from the trade union, which was not a government creation, there were no novel changes to the operations-related structures. The MPS and its main directorates, most of the various central and regional traffic planning committees, and all the transport operating companies remained in situ. The prominent exception was the inter-ministry Administrative Committee for deciding freight shipment priorities: it was abolished in April 1917.⁷⁸ But again, the idea was not new. A.N. Frolov, an engineer and member of the Special Shipments Conference, had proposed this measure in May 1916, and in January 1917 the Special Shipments Conference had instructed the Administrative Committee to consider his report.⁷⁹ Importantly, as long as the government failed to improve the management of military demands for transport capacity, the risk of essential civilian needs being neglected would remain significant.

Outcomes: Performance and Demand

Gaps in the wartime statistical record – increasingly a problem as railways struggled to submit their reports punctually – were often not acknowledged when MPS officials compiled network-wide reports about operating performance before the February Revolution.⁸⁰ Thereafter, the problem became worse, especially after about May 1917. But if one accepts the reported numbers for system-wide operations as indicative rather than absolute, they can still provide a general impression of freight transport during 1917. For example, if 8,000 million puds of goods were loaded in 1913, the figure for 1917 was much lower at 5,500 million puds.⁸¹ That dramatic decline, moreover, must be seen in the context of the work recorded for 1916, which was roughly 20% above the 1913 level.⁸² The same basic picture is shown by more specific sources, such as the recorded arrivals of loaded freight wagons at Petrograd. If an average of 306 wagons of coal arrived at the capital each day in 1916, the comparable figure for 1 January–30 September 1917 was just 168 – about 55% of the 1916 performance. The analogous figures for arrivals of food were 431 wagons per day for 1916 and just 309 per day for 1 January–30 September 1917 – roughly 72% of the 1916 level.⁸³

Army records for wagonload deliveries of food to the fighting fronts during November 1915–November 1917 provide a clear and relatively reliable perspective on railway activity. Table 3 shows the planned and actual monthly figures for overall deliveries, encompassing such goods as flour, meat, sugar, oats and cattle. Through to June 1916 deliveries remained close to plan, and even surpassed the target in May 1916. Thereafter a large shortfall against the target was recorded each month, although importantly, the deliveries actually completed during November 1916–March 1917 either matched or even exceeded the results during the same period a year earlier with the exception of February 1917. But from April 1917 onwards performance slumped far below the previous year's results. One might question the realism of the plan targets from winter 1916/17, which ignored the natural pattern of summer peak and winter low, but

these actual results confirm that the transport system's performance was disintegrating throughout the spring, summer and autumn of 1917.⁸⁴

Yet demand remained high. An attempt was made to dampen non-urgent civilian demand by emphasising military shipments and centrally planned food and fuel shipments in a new July 1917 edition of the freight dispatch rules first introduced in July 1915.⁸⁵ But once again this measure was not the strict rationing that the situation demanded. As Table 3 confirms, by this time the actual freight movements were well below the monthly target amounts for even the priority day-to-day military demands, let alone the requirements for immediate civilian use and winter stockpiling. Necessarily, the shortfalls between the cumulative actual deliveries of core commodities and the cumulative targets were increasing every month.

Conclusions

There was no simple answer to Russia's logistical problems in spring 1917. In the context of on-going global warfare, a substantial rapid improvement required an early peace treaty with the Ottoman empire and preferably also a marked reduction in army demand for long-distance shipments. However, with the western Allies unwilling to countenance a separate peace with Constantinople, that scenario was never contemplated. Unwilling to sue for peace, the Provisional government thus had to confront the same intractable challenge of waging a two-front war amid a dual enemy naval blockade that the Tsarist regime had faced.

Whether or not the new ministers grasped the full complexity of this logistical conundrum, they did not, for all their earlier anger in opposition, offer any new strategy. The principal transport policies that they took from the Stavka conference of 30 March – maximising the use of waterways, investment in new railways and capital equipment, and repair of existing locomotives – had all been priorities of the old regime. To its credit, the Provisional government did act quickly on these policies. But sorely needed initiatives to manage public expectations, ration transport capacity, and balance military demands much more effectively with the core civilian needs did not follow. With L'vov himself acknowledging that no increase in the volume of freight shipments was likely before June, and the Stavka conference pinning its hopes on imported equipment that could not enter service before 1918, the revolutionary government appears actually to have settled in the spring for tinkering and damage limitation in order to keep freight moving during 1917.

As of 30 March it was not unrealistic for the government to aim to maintain freight traffic at its current level for at least a few months. Railway officials seemed confident that they could sustain it, and the army representatives were adamant that only a modest reduction of their ration commitment was needed for the promised food deliveries to be sufficient. But this scenario

meant that food and fuel deliveries to the urban areas would be insufficient for stockpiling for the 1917/18 winter, and possibly even for some day-to-day basic needs: widespread food riots before the 1918 harvest were thus a real possibility. Also, it required the workforce to continue working more or less normally. Yet as the Stevens mission quickly discovered during May–June, that did not happen. Much of this problem was a function of the on-going revolutionary turmoil, but the way that the railway trade union developed and operated made a significant contribution. Through a process that minister Nekrasov actively encouraged, Vikzhel became a hugely disruptive force. It spurred a big decline in labour productivity that made the spring volume of freight traffic impossible to sustain. Crucially, with the railway gendarme corps disbanded and its replacement inadequate, the Provisional government lacked any coercive authority over the railway workforce to arrest that decline. From as early as June 1917 a hungry winter became ever more likely.

Table 3 Food deliveries to army stores at the fighting fronts, November 1915–November 1917

| | 1915 plan | 1915 actual | 1916 plan | 1916 actual | 1917 plan | 1917 actual |
|-----------|-----------|-------------|-----------|-------------|-----------|-------------|
| January | | | 51,243 | 56,688 | 93,992 | 63,283 |
| February | | | 58,987 | 55,567 | 88,256 | 49,211 |
| March | | | 72,385 | 71,316 | 93,961 | 71,630 |
| April | | | 83,790 | 78,747 | 90,930 | 38,844 |
| May | | | 94,116 | 94,475 | 80,476 | 66,404 |
| June | | | 87,960 | 83,599 | 67,080 | 60,269 |
| July | | | 93,837 | 80,909 | 69,316 | 39,002 |
| August | | | 97,837 | 64,652 | 69,316 | 32,027 |
| September | | | 80,970 | 56,480 | 59,490 | 40,398 |
| October | | | 84,041 | 62,711 | 59,923 | 43,495 |
| November | 57,075 | 33,445 | 81,810 | 57,434 | 57,990 | 34,425 |
| December | 51,243 | 42,284 | 99,417 | 62,726 | | |

Source: ‘Spravka o ezhemesiachnom pritoke na fronty intendantskikh gruzov’, [circa December 1917] (RGVIA f. 2004, op. 3, d. 357, ll. 54ob.–55).

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⁴ Gatrell *Russia's First World War*, 207–15; see also Volobuev, P. V. *Ekonomicheskaiia politika Vremennogo pravitel'stva* (Moscow: AN SSSR, 1962).

⁵ The specialist literature about Russian transport in 1917 is small. Useful starting points are: Pethybridge, R. W. 'The Significance of Communications in 1917' *Soviet Studies* 19, 1, 1967–68, pp. 109–14; Argenbright, R. T. 'The Russian Railroad System and the Founding of the Communist State, 1917–1922' (Ph.D. diss., University of California at Berkeley, 1990); Senin, A.S. *Ministerstvo putei soobshcheniia v 1917 godu*, 2nd edn (Moscow: Knizhnyi dom Librokom, 2009); Senin, A. S. *Zheleznodorozhnyi transport Rossii v epokhu voin i revoliutsii (1914–1922 gg.)* (Moscow: GOU Uchebno-metodicheskii tsentr po obrazovaniiu na zheleznodorozhnom transporte, 2009); Augustine, W. R. 'Russia's Railwaymen, July–October 1917' *Slavic Review* 24, 4, 1965, pp. 666–79.

⁶ These brief biographical notes are based on the respective entries in Volobuev, P. V. et al (eds) *Politicheskie deiateli Rossii 1917: Biograficheskii slovar'* (Moscow: Bol'shaia Rossiiskaia Entsiklopediia, 1993) and Shelokhaev, V. V. et al (eds), *Politicheskie partii Rossii, Konets XIX–pervaia tret' XX veka: Entsiklopediia* (Moscow: ROSSPEN, 1996).

⁷ For the creation of these committees see Siegelbaum, L. H. *The Politics of Industrial Mobilization in Russia, 1914–17: A Study of the War-Industries Committees* (London: Macmillan, 1983), pp. 40–68.

⁸ For a succinct introduction to the politics of wartime tsarist Russia see Waldron, P. 'The End of Tsarism', in Read *Russia's Home Front*, 1–20. On the Kadets see, for example, Pearson, R. *The Russian Moderates and the Crisis of Tsarism 1914–1917* (London: Macmillan, 1977) and Stockdale, M. K. *Paul Miliukov and the Quest for a Liberal Russia, 1880–1918* (Ithaca NY: Cornell University Press, 1996), pp. 218–49.

⁹ For example: unsigned editorial comment articles, *Rech'*, 28 October 1915, 1–2 and 29 October 1915, 1; L. L'vov, 'S. V. Rukhlov', *Rech'*, 28 October 1915, 2; unsigned editorial comment article, *Rech'*, 16 March 1916, 1–2; Duma speeches by A. I. Shingarev and N. V. Nekrasov, *Rech'*, 22 March 1916, 4.

¹⁰ For example: Rossiiskii gosudarstvennyi istoricheskii arkhiv (RGIA) f. 1276 (Sovet ministrov), op. 12, d. 263, ll. 1–2ob. (A. A. Polivanov (War Minister) to B. V. Shturmer (Chair of the Council of Ministers), 1 March 1916); 'Zaiavlenie', signed by 35 State Duma deputies, 26 February 1916 (RGIA f. 1278 (Gosudarstvennaia дума), op. 5, d. 1041, ll. 1–2).

¹¹ For example: Merkulov, S. D. 'Nedostatok prodovol'stvennykh produktov v Petrograde i zheleznodorozhnoe vedomstvo' *Novyi ekonomist* 41 (10 October 1915), pp. 6–8.

¹² Rodzianko, M. V. 'Gosudarstvennaia Duma i fevral'skaia 1917 goda revoliutsiia' *Arkhiv russkoi revoliutsii* 6 (Berlin: Gessen, 1922), pp. 23–24, 45; Rodzianko, M. V., 'Krushenie Imperii (Zapiski predsedatelia Russkoi Gosudarstvennoi Dumy)' *Arkhiv russkoi revoliutsii* 17 (Berlin: Gessen, 1926), pp. 100, 108–09, 157; Grinevetskii, V. I. *Poslevoennye perspektivy russkoi promyshlennosti* (Moscow, 1922), especially 108–37.

¹³ Vasil'ev, N. *Transport Rossii v voine 1914–1918* (Moscow: Voenizdat, 1939); Sidorov, A. L. (ed.) *Ekonomicheskoe polozhenie Rossii nakanune Velikoi oktiabr'skoi sotsialisticheskoi revoliutsii: Dokumenty i materialy, mart-oktiabr' 1917 g., chast' pervaiia* (Moscow-Leningrad: Izdatel'stvo Akademii nauk SSSR, 1957), pp. 565–634 (a slightly revised version of his 1948 article 'Zheleznodorozhnyi transport Rossii v pervoi mirovoi voine i obostrenie ekonomicheskogo krizisa v strane', *Istoricheskie zapiski* 26, 1948, pp. 3–64); Senin, *Zheleznodorozhnyi transport Rossii*.

¹⁴ See Westwood, J. 'The Railways', in Davies, R. W. (ed) *From Tsarism to the New Economic Policy: Continuity and Change in the Economy of the USSR* (Basingstoke: Macmillan, 1990). For a more recent and more extensive commentary, see Heywood, A.J. 'Imperial Russia's Railways at War, 1914–17: Challenges, Result, Costs, and Legacy', in Read *Russia's Home Front*, pp. 65–92.

¹⁵ On the Russian case see Luntinen, P. *French Information on the Russian War Plans, 1880–1914* (Helsinki: Suomen Historiallinen Seura, 1984); Heywood, A. J. "'The most catastrophic question": railway development and military strategy in late imperial Russia' Otte, T. G and Neilson, K. (eds.) *Railways and International Politics: Paths of Empire*, (Abingdon: Routledge, 2006), pp. 45–67.

¹⁶ Mellor, R. E. H. *German Railways: A Study in the Historical Geography of Transport* (Aberdeen: University of Aberdeen, 1976), pp. 18–19.

¹⁷ 'Spravka k \$58 smetu', [spring 1914]; Response by Minister of Ways of Communication to Duma Budgetary commission, [spring 1914] (RGIA f.273, op.10, d.2642, ll.86, 63–66); Head of Directorate of

Railways to Congress of Representatives of Stock Market Trade and Agriculture, [1915] (RGIA f.32, op.1, d.730, l.6).

¹⁸ This point is made explicitly in a December 1907 report to deputy minister V. A. Miasoedov-Ivanov by the Acting Head of Department for Monitoring the Repair of Rolling Stock after the Russo-Japanese War (RGIA f.229, op.4, d.414, ll.36–42).

¹⁹ Concerning the wartime waterways see Vasil'ev *Transport Rossii v voine*, 22–27, 117–25.

²⁰ *30 let deiatel'nosti tovarishchestva nefianogo proizvodstva Brat'ev Nobel', 1879–1909* (St Petersburg, 1910), pp. 139–248.

²¹ The coal statistic is in: Draft report by Minister Trepov to the Tsar, circa November 1916 (RGIA f.229, op.4, d.414, l.178). Generally on the movement of goods by railway and waterway from and to Archangel see Heywood, A. J. 'The Limits of Competence: Coping with Armageddon on the Archangel Railway, 1913–March 1917 (working paper)'. Cited 23 October 2021. Available online at: <http://aura.abdn.ac.uk/handle/2164/8416>.

²² Draft report by Minister Trepov to the Tsar, circa November 1916 (RGIA f.229, op.4, d.414, l.177ob.).

²³ Heywood, A. J. 'The Logistical Significance of the Turkish Straits, Russo–Ottoman War and Gallipoli Campaign in Imperial Russia's Great War, 1914–1917', *Revolutionary Russia* 30, 1, 2017, pp. 16, 29–30 and note 43.

²⁴ For example: Minutes of Temporary Administrative (*rasporiaditel'nyi*) Committee meeting 26, 18 February 1916 (RGIA f. 290, op. 1, d. 1, ll. 56–57).

²⁵ See Heywood, A. J. 'Spark of Revolution? Railway Disorganisation, Freight Traffic and tsarist Russia's War Effort, July 1914–March 1917' *Europe–Asia Studies* 65, 4, 2013, pp. 753–72.

²⁶ The pud-verst is the best available performance indicator for freight traffic, for it reveals actual work by including both the weight of the goods and the distance moved. One pud equated to 16.38 kg; one verst equated to 1.06 km. The modern metric and imperial/US equivalents are tonne-kilometres and ton-miles.

²⁷ For a discussion of wartime winter weather that confirms and clarifies the exceptionality of the 1916/17 winter see Heywood, A. J. 'Climate, Weather, and Tsarist Russia's Great War, 1914–1917: The Wartime Winters', in Heywood, A. J et al (eds.) *Science, Technology, Environment and Medicine in Russia's Great War and Revolution, 1914–22* (Bloomington, IN: Slavica, 2022).

²⁸ Data for planned and actual arrivals of such wagons in Petrograd between 16 December 1916 and 31 March 1917 are shown at Heywood 'The Logistical Significance of the Turkish Straits', 8.

²⁹ See Heywood, A. J. 'War and Military Mobility in 1914: Russia's General Mobilisation in Logistical Perspective', unpublished working paper.

³⁰ Hamilton, J. A. B. *Britain's Railways in World War I* (London: George Allen and Unwin, 1967), pp. 37–42.

³¹ See Heywood 'The Logistical Significance of the Turkish Straits', 8.

³² Examples from the Kadet-supporting newspaper *Rech'* are: 'Prodoval'stvovanie Petrograda', 24 October 1914, 5 (about butter supply); 'Neftianoi krizis', 7 November 1914, 5; 'Ugol'nyi krizis', 5 March 1915, 4, and 14 March 1915, 6; 'K ugol'nomu krizisu', 15 March 1915, 5; 'Obespechenie naseleniia khlebom', 17 March, 4. Similar examples from the important government-supporting paper *Novoe vremiia* are: 'Vzdorozhanie zhizni', 23 November 1914, 7; 'Chainyi golod', 28 January 1915, 5; 'Ugol'nyi krizis', 28 February 1915, 4; 'Ugol'nyi krizis v stolitse', 5 March 1915, 3.

³³ See especially the minutes of the inter-ministry Administrative Committee (*Rasporiaditel'nyi komitet*) for freight traffic planning, mainly in RGIA f. 273, op. 10, dd. 2592 and 3041 (July 1914–July 1915) and f. 290, op. 1, dd. 1–4, 6 (December 1915–April 1917). A specific example from this committee is cited in note 39 below.

³⁴ This document was known as MPS Circular 19077, and was widely reprinted, such as: Tsirkuliar U Zh D gg. nachal'nikam kazennykh, upravliaiushchim i direktoram chastnykh zheleznykh dorog, predsedateliam poraionnykh komitetov, kopii pravleniiam chastnykh zheleznodorozhnykh obshchestv, 27 iulia 1915g, za No.19077/14754/215. O poriadke otpravleniia vneocherednykh gruzov i ob ustanovlenii novykh kategorii ocherednykh gruzov. Vypiska iz Sbornika tarifov rossiiskikh zheleznykh dorog No.2402 ot 13 avgusta 1915 goda (Petrograd, 1915).

³⁵ Common tactics used by private shippers to evade restrictions included bribing railway staff to send a consignment by a very circuitous route, load a consignment for a restricted route without the necessary permit, or continue loading after getting notice to cease loading. For further detail see Heywood 'Imperial Russia's railways at War', 75 and note 28.

³⁶ This issue is the focus of Heywood 'The Logistical Significance of the Turkish Straits'.

³⁷ Murmansk port did not become available until the winter of 1916/17.

³⁸ For instance, report No. 15 by MPS Chief Inspector, 12 May 1915, about his inspection of transport operations in the Caucasus (RGIA f. 269, op. 2, d. 89, l.65).

³⁹ Minutes of Administrative Committee meeting No. 27, 21 January 1915 (RGIA f. 273, op. 10, d. 3041, l. 41ob.).

⁴⁰ On this context see Bobroff, R. P. *Roads to Glory: Late Imperial Russia and the Turkish Straits* (New York: I. B. Tauris, 2006).

⁴¹ Hughes, M. 'From the February Revolution to the Treaty of Brest-Litovsk', in Schimmelpenninck van der Oye, D. et al (eds) *Russian International Relations in War and Revolution, 1914–22, Book 2: Revolution and Civil War* (Bloomington, IN: Slavica, 2021), pp. 6–9; Stockdale, Paul Miliukov, 252–57.

⁴² Heywood, A. J. 'The Militarisation of Civilians in Tsarist Russia's First World War: Railway Staff in the Army Front Zones', in Stoff, L. S. et al (eds) *Military Affairs in Russia's Great War and Revolution, 1914–22, Book 1: Military Experiences*, (Bloomington, IN: Slavica, 2019), pp. 354–55; Senin, *Zheleznodorozhnyi transport*, 177–79.

⁴³ Rossiiski gosudarstvennyi voenno-istoricheskii arkhiv (RGVIA) f. 2004 (Upravlenie nachal'nika voennykh soobshchenii pri Verkhovnom glavnokomanduiushchem, 1914–1918 gg.), op. 3, d. 748, ll.34–ob., 76 (Chief of Staff Alekseev to Chair of the Council of Ministers Prince G.E. L'vov, 9 March 1917;

L'vov to Alekseev, 12 March 1917). The Council of Ministers was formally renamed as the Provisional government on 10 March.

⁴⁴ 'Zhurnal mezhdovedomstvennogo soveshchaniia v shtabe glavnokomanduiushchego', 30 March 1917, uncorrected first draft (RGVIA f. 2004, op. 3, d. 748, ll. 309–23ob.).

⁴⁵ Heywood, A. J. *Modernising Lenin's Russia: Economic Reconstruction, Foreign Trade and the Railways* (Cambridge: Cambridge University Press, 1999), pp. 26–31.

⁴⁶ 'Obzor gruzovogo dvizheniia i perevozok za 16–30 apreliia 1917 g.' (RGIA f. 273, op. 10, d. 3716, l. 105ob.).

⁴⁷ 'Obzor gruzovogo dvizheniia i perevozok za 16–30 apreliia 1917 g.' (RGIA f. 273, op. 10, d. 3716, l. 106ob.).

⁴⁸ This commission is the focus of Schneider, B. C. 'Responding to the People: The Borisov Commission and the (Misnamed) Five-Year Railroad Construction Plan of 1916', in Read *Russia's Home Front*, pp. 93–106, with particular reference to the policy-making involvement of public organisations and associations.

⁴⁹ Senin, *Zheleznodorozhnyi transport*, 166–69.

⁵⁰ Dodonov, B. F. et al (eds), *Zhurnaly zasedanii Vremennogo pravitel'stva, tom 1: Mart–aprel' 1917 goda* (Moscow: Rosspen, 2001), pp. 214–15; Heywood *Modernising Lenin's Russia*, 36–47.

⁵¹ Concerning the earlier wartime contracts for imports see Heywood, *Modernising Lenin's Russia*, 23–35; Heywood, A. J. 'Russia's Foreign Supply Policy in World War I: Imports of Railway Equipment', *The Journal of European Economic History* 32, 1, 2003, pp.77–108, especially 87 for a summary list of the contracts by category.

⁵² Sidorov *Ekonomicheskoe polozhenie Rossii nakanune Velikoi oktiabr'skoi sotsialisticheskoi revoliutsii*, 371–76. These documents appear not to have been included in Dodonov's edition of the minutes of the Provisional government's sessions.

⁵³ For example: Draft letter to the Minister of Ways of Communication from Council of Congress of Representatives of Industry and Trade, circa December 1913 (RGIA f.32, op.1, d.719, ll.99–101ob.; see especially ll.100–ob.); 'Dokladnaia zapiska', addressed to the ministers of ways of communication, finance, trade and industry, and agriculture, and also to the minister for state control, February 1915 (RGIA f.32, op.1, d.719, ll.107–10).

⁵⁴ On wartime losses and destruction see Heywood, A. J. 'War, Civil War and the "Restoration" of Russia's Industrial Infrastructure, 1914–25: the Fate of the Railway Locomotive Stock' *Revolutionary Russia* 25, 1, 2012, pp. 31–59, and Heywood, A. J. 'War Destruction and Remedial Work in the early Soviet Economy: Myth and Reality on the Railroads' *The Russian Review* 64, 3, 2005, pp. 456–79.

⁵⁵ Heywood *Modernising Lenin's Russia*, 33–37.

⁵⁶ 'Osobyi zhurnal Soveta ministrov', 13 March 1915 (draft) (RGIA f. 268, op. 5, d. 311, ll. 5–8); Central War Industries Committee, Commission to investigate the wagon shortages, meeting no.3, 28 August

1915 (RGIA f. 268, op. 5, d. 312, ll. 113–16ob.); Report by MPS Directorate of Railways [to Council of Ministers?], 16 September 1915 (RGIA f. 273, op. 6, d. 3100, ll. 53–55ob.); MPS Directorate of Railways to Special Conference for Shipments, 6 July 1916 (RGIA f. 268 op. 5, d. 323, l. 417ob.); Council of Representatives of Locomotive-building Factories to MPS Deputy Minister Voinovskii-Kruger, 19 July 1916 (RGIA f. 31, op. 1, d. 64, l. 108).

⁵⁷ Senin *Zheleznodorozhnyi transport*, 172; ‘Zhurnal soveshchaniia’ (RGVIA f. 2004, op. 3, d. 748, ll. 322–ob.).

⁵⁸ MPS Directorate of Railways Operations Department to Provisional government, June 1917, chart 14 (RGIA f. 273, op. 10, d. 3677, l. 48).

⁵⁹ Klemenchich, V. *Itogi raboty zheleznykh dorog za tri goda 1917–1920 gg.* (Moscow: Izdanie Tsekhtrana i Politupravleniia NKPS, 1920), p.10.

⁶⁰ See Heywood *Modernising Lenin’s Russia*, 40–41; Foust, C., *John Frank Stevens: Civil Engineer* (Bloomington and Indianapolis: Indiana University Press, 2013, pp. 197–259).

⁶¹ Reichman, H. *Railwaymen and Revolution: Russia, 1905* (Berkeley: University of California Press, 1987), especially 291–305; Heywood ‘The Militarization of Civilians’, 337–39.

⁶² The first major attempt to provide systematic financial assistance, albeit initially only for personnel employed on state railways, became known as the Rules of 28 April 1915. For details see Heywood ‘Militarization of Civilians’, 341–42.

⁶³ The first one was in ‘Prikaz po M P S’, 5 March 1917 (cited from the copy at RGIA f. 229, op. 2, d. 1633, ll. 580–81).

⁶⁴ Three files of papers pertaining to Plekhanov’s commission are preserved at RGVIA f. 2004, op. 3, dd. 139–41.

⁶⁵ Nekrasov to the Head of the MPS Directorate of Railways and all heads of railways, 7 March 1917 (RGIA f. 273, op. 1, d. 2985, l. 192).

⁶⁶ On the emergence of Vikzhel see Augustine, ‘Russia’s Railwaymen’, 667–69.

⁶⁷ Cited from the copy at RGIA f. 32, op. 1, d. 659, ll. 17–20.

⁶⁸ Senin *Ministerstvo putei soobshcheniia*, 63–66.

⁶⁹ Senin *Zheleznodorozhnyi transport*, 195–98.

⁷⁰ Zakrevskaia, G. P. and Gol’ianov, A. L. *Rukovoditeli vedomstva putei soobshcheniia Rossii i SSSR (1797–1995): Katalog kollektzii khudozhestvennykh portretov, biograficheskie svedeniia* (St Petersburg: MPS RF-Tsentrāl’nyi muzei zheleznodorozhnogo transporta Rossii, 1995), pp. 41–44; Senin *Ministerstvo putei soobshcheniia*, 215–16 (extract from Liverovskii’s diary).

⁷¹ An early example is Nekrasov to I. K. Ivanovskii, 9 March 1917 (RGIA f. 229, op. 2, d. 1633, l. 29). Ivanovskii had been head of the Nicholas Railway and MPS Chief Inspector, and his resignation was demanded because of his ‘former activity’.

⁷² On the rise of the red specialists see Bailes, K. E. *Technology and Society under Lenin and Stalin: Origins of the Soviet Technical Intelligentsia, 1917–1941* (Princeton NJ: Princeton University Press, 1978).

⁷³ Head of MPS Directorate of Railways to the Deputy Heads of Directorate, heads of departments and sections, 23 March 1917 (RGIA f. 273, op. 10, d. 3678, l. 21).

⁷⁴ Dodonov et al (eds) *Zhurnaly, tom 1*, 24.

⁷⁵ Dodonov et al (eds) *Zhurnaly, tom 1*, 26.

⁷⁶ The file at RGVIA f. 2004, op. 3, d. 183 is devoted to this process, which is described tellingly in the file name as a ‘reform’.

⁷⁷ This policy is the subject of RGVIA f. 2004, op. 3, d. 188.

⁷⁸ Senin *Ministerstvo putei soobshcheniia*, 53.

⁷⁹ Frolov’s report of 10 May 1916 is at RGIA f. 268, op. 5, d. 325, ll. 82–85; Minutes (extract) of the Administrative Committee meeting No. 135, 26 January 1917 (RGIA f. 290, op. 1, d. 6, ll. 1–5).

⁸⁰ A telling exception is a caveat that was added to a 1916 report entitled ‘Dannye o gruzovoi rabote i utilizatsii podvizhnogo sostava za 1913 i 1915 gg.’: it warned about the reduced accuracy of railway statistics during the war. Cited from the copy at RGIA f. 269, op. 2, d. 98, ll. 25–49ob. (l. 25ob.).

⁸¹ Senin *Zheleznodorozhnyi transport*, 193, cited from *Vestnik putei soobshcheniia*, 5 (1918): 24–25 (the transport commissariat’s weekly official bulletin).

⁸² See Heywood ‘Spark of Revolution?’, *passim*.

⁸³ Data from Table 7 (coal) and Table 2 (main food products) at RGIA f. 273, op. 10, d. 3728, ll. 182, 183–ob.

⁸⁴ ‘Spravka o ezhemesiachnom pritoke na fronty intendantskikh gruzov’, [circa December 1917] (RGVIA f. 2004, op. 3, d. 357, ll. 54ob.–55).

⁸⁵ Senin *Zheleznodorozhnyi transport*, 180.