From Tractors to Territory: Socialist Urbanization through Standardization

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Abstract
This article proposes that the Fordist model of industrial standardization enabled and empowered the Soviets to enact distinctly socialist, decentralized, urban patterns. It follows the design of the Kharkiv Tractor Factory (KhTZ) and the socialist city (sotsgorod) to house its workers, built outside of the first capital of Soviet Ukraine between 1930 and 1931. The near-impossible schedule of Stalin’s hyperindustrialization drive, known as the first Five-Year Plan (1928-1932), limited the options both tractor factory and sotsgorod designers could pursue, which made easily replicable architectural types and models particularly attractive. Once tested on an experimental site like KhTZ, a type deemed successful joined the ranks of those ready for slight adjustment—a process known as priviazka in Soviet architectural discourse—and export to far-flung sites in the Soviet sphere.

Keywords
socialist urbanism, Soviet industrialization, architectural standardization, Albert Kahn, tractors

We still know very little about how the Soviet built environment was developed in the first decades after the Revolution. The scholarship on early Soviet architecture and planning that does exist relies heavily on the paper projects of Moscow’s avant-garde. But brick and mortar, steel and concrete projects in peripheral industrial sites where capital expenditure was greatest and design experimentation most intense can tell us much about how design was employed in the first decades of the Union of Soviet Socialist Republics (USSR) to solve unprecedented social tasks and to set the ground rules for Soviet territorial expansion and control. Complications produced by emergent technologies, impossible deadlines, and inchoate theories of socialist space-making forced design practitioners active in the Soviet sphere to innovate. Their solutions, produced under conditions of crisis and possibility, came to define socialist design praxis.

In this essay, I propose that the Fordist model of industrial standardization enabled and empowered the Soviets to enact distinctly socialist urban patterns. To substantiate this claim, I follow the design of the Kharkiv Tractor Factory (Kharkivskii Traktorniy Zavod, hereafter KhTZ) and the “socialist city” (sotsialisticheskii gorod or sotsgorod) to house its workers, built outside of the capital of Soviet Ukraine between 1930 and 1931. Designers for both the tractor factory

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and the sotsgorod employed architectural standardization to meet the breakneck speed of development during Stalin’s hyperindustrialization drive, known as the first Five-Year Plan (1928-1932). The near-impossible schedule of the Plan limited the options designers could pursue, which made easily replicable architectural types and models particularly attractive. Once tested on an experimental site like KhTZ, a type deemed successful might join the ranks of those ready for slight adjustment and export to some far-flung site in the Soviet sphere. The architectural practice in which a standard design was tweaked to meet the demands of a particular condition had a name in Soviet architectural discourse: priviazka, or “binding” to the site. The logic of this essay requires the reader to follow the scalar expansion of standardization from the object (tractor), to the building (tractor factory), to the urban unit (sotsgorod), to territory (Soviet space).

What I am suggesting is that lessons learned about industrial standardization at the object scale ultimately led to the design of repeatable urban units. Priviazka was the process by which standard types and models were adjusted to settle heterogeneous Soviet territories.

At the center of this particular story are two architects—one American, one Soviet—each tasked to design a replicable architectural product. American architect, Albert Kahn, was hired by the Soviets in 1929 to design a single tractor factory for Stalingrad. The ambitious timetable set by state economic planners to meet first Five-Year Plan targets did not allow for a period of internal architectural research and development, nor were there experienced Soviet industrial architects to lead the charge. Pragmatism, forced by the schedule, led the Supreme Soviet of the National Economy (Vysshii sovet narodnogo khoziaistva, VSNKh) to Henry Ford’s architect, Kahn, just as it led them to German architect, Ernst May, to design Soviet steel city Magnitogorsk. Between 1930 and 1932, Kahn’s Soviet consultancy expanded to include modification of industrial building types to new sites, like the Stalingrad tractor plant for Kharkiv, as we shall see, and design of other new industrial types. At the same time that the tractor factory was being fit for the Kharkiv site, Soviet architect Pavel Aleshin was tasked to design a model socialist city for 36,000 residents at KhTZ in less than six months. To do so, he and his team created replicable model superblocks filled with socialist housing and civic building types.

Three important terms anchor this narrative: type, model, and standardization. Type and model should not be conflated, as they work at different scales and require differing degrees of exactitude. The tractor factory at KhTZ constitutes a type: it is a building so integrally designed to meet functional requirements that it asks to be copied near-exactly. The sotsgorod at KhTZ is a model: a loose template for future urban form based on spatial and social relations. Another way of articulating the difference is to insist that a type is tied to its plan, and cannot deviate from it, whereas a model can be abstracted into a diagram that may generate any number of plans. Standardization is the practice by which a type or model is replicated and widely disseminated. The Soviet-inflected standardization process of priviazka proved to be invaluable to instantiate the diffused urban settlement patterns promised by the map of the first Five-Year Plan.

Strategic differences between the original tractor factory at Stalingrad and its replica at Kharkiv reveal a complex story of Soviet expectations and conditions modifying western designs and construction techniques. Kharkiv was not a carbon copy of Stalingrad in either material or labor terms, and these differences signal the reformulation of industrial practices to meet the capacities of a still-developing socialist context. In my analysis of these events, I utilize the notion of circulation des savoirs elucidated in the Soviet context by historian of technology (and expert on Soviet tractors), Yves Cohen. This methodological approach insists that expertise—in this case architectural—is grown and transformed through the looping interaction of specialists and objects in varied political, economic, and cultural contexts. While older scholarship, like the work of Anthony Sutton or Kendall Bailes, told stories of unidirectional transfer of western technology to the USSR, Cohen’s research suggests that Soviet borrowing was locally inflected and transformative of the objects of exchange. Architectural types were used for ends not anticipated by their creators, demonstrating the flexibility and receptivity of standard designs to take root in varied contexts.
In what follows, I provide a brief overview of emergent socialist urban theory from late 1929, when KhTZ was chosen as the site for a new tractor factory. I situate the tractor within its early Soviet context by examining the context of agricultural collectivization that made it such a necessary and coveted machine—one that also modeled a process of industrial standardization adopted by Soviet architects and planners. I then address the planning and construction of KhTZ and its sotsgorod, and consider the ways in which the project was impacted by the “shock-work” culture of the first Five-Year Plan. The tempo of the Plan forced Soviet economic and physical planners to devise a host of accelerating strategies; standardization was one that allowed the architects of KhTZ to meet the unreasonable construction timetable set by the Ukraine’s Metallurgic Planning Agency, UkrGipromez. Although not without its failures and drawbacks, architectural standardization—and specifically priviazka—emerged from the Kharkiv experiment as one of the primary strategies by which the Soviet Union was industrialized, settled, and housed.

Socialist Space

To achieve “Socialism in One Country,” the first Five-Year Plan sought to generate technology and foodstuffs within Soviet borders, an effort that required intelligent utilization of the natural resources and population of the USSR. A body of socialist urban theory developed in late 1929 in response to the Plan’s projections for rapid industrialization. Leonid Sabsovich, an economist at VSNKh and thought leader on physical planning issues, advocated for a new, distinctly socialist settlement model. In a pamphlet titled Cities of the Future and the Organization of the Socialist Everyday Life, Sabsovich argued that dense urban agglomerations were the legacy of capitalism. Unless the Plan’s authors made a conscious effort to find another sociospatial model, Soviet urbanization would follow the same path, to disastrous effect. Sabsovich’s main spatial proposal was “to immediately start developing plans not for continued expansion of [Soviet] cities, but for their decentralization,” a suggestion that followed Engels’—then Lenin’s—prognosis of diffuse spatial organization under socialism.

In 1914, Lenin wrote that the socialization of labor would lead to “redistribution of the human population (thus putting an end both to rural backwardness, isolation and barbarism, and to the unnatural concentration of vast masses of people in big cities).” In Sabsovich’s plan, new socialist settlements associated with industrial and agricultural complexes would replace existing cities and villages altogether. Technology was the key to enacting this decentralized spatial model. “The condition that will assist us in realizing these objectives, is above all the ‘victory over the distance’ (pobeda nad rasstoianiem),” Sabsovich wrote.

[With] the vast number of large power plants and the possibility to transmit energy over long distances, we can to a large extent free ourselves from the attachment between industry and the fuel base and we will be able to distribute industrial enterprises with much greater territorial freedom, in the interest of placing settlements in the most suitable location for the workers.

With the “victory over distance,” an appropriately revolutionary slogan for socialist spatial practices was coined. What did it mean? First, as Sabsovich explained, conquest of the vastness of Soviet territories was made possible by the continuing eastward expansion of the Soviet electric grid. In citing the emancipatory potential of electric power, Sabsovich tapped into enduring Party enthusiasm for electrification that first emerged in the GOELRO (State Commission for the Electrification of Russia) Plan of 1920, the one utopian project Lenin supported. (Figure 1) The map for the GOELRO Plan showed blue dots for each existing generation station, each of which radiated light pink circles to indicate service area. The pink circles overlapped and melded together to create contiguous—though still partial—electrified territories. In addition, the rails,
roads, and telephone/telegraph wires that crisscrossed the geographical expanse of the Union could connect far-flung nodes, Sabsovich argued. Instead of being tethered to sites of fuel extraction or urban rail hubs, settlements could be founded in remote corners of the country. The nascent Soviet science of logistics would ensure that the fruits of industrial and agricultural labor could travel where needed.

Socialist spatial theory and economic strategy arrived at a polynuclear settlement pattern intended to reduce crowding in pre-revolutionary cities, diffuse economic development among many sites, and control the immense territories now under Soviet power. The map of the first Five-Year Plan was anchored by a key filled with industrial “types”—electrical stations, steel and tractor factories—that were scattered across the Eurasian continent in an immense multi-nodal constellation (Figure 2). Many of the locations earmarked for heavy industry in the Plan were undeveloped sites of mineral wealth far removed from existing transportation infrastructure. Under these circumstances, architectural standardization—here meaning not only the use of standard building types but also the introduction of a one-stop centralized design process—became a key component of Soviet national planning and industrial development. “Pop up” industrial complexes that utilized standardized drawings, materials, and construction techniques, the purview of western expertise, aligned with the Soviet aspirations to rapidly develop far-flung production sites.

Figure 1. The GOELRO plan for the electrification of Russia, 1920. 
Source: Russian State Library map collection.
The tractor was a powerful propagandizing tool in 1920’s Soviet culture, as evidenced by its central role and frequent appearance in popular films released during the first Five-Year Plan. In *The General Line* (director: Sergei Eisenstein, 1929) and *Earth* (director: Aleksandr Dovzhenko, 1930), the long-awaited tractor promised to enact transformation of the everyday way of life (*byt*) and rural landscapes in three particularly spatial ways. At the most intimate scale, the tractor lifted the former peasant, now agricultural worker, above the ground. In this elevated position, a new perspective emerged that focused on the extended smooth horizon rather than the immediate, tactile foreground. Second, the tractor’s efficient plows were capable of altering and inscribing the earth with the clean Euclidean geometries of mechanization, a purposeful conquering act of society over nature. Finally, and most importantly from a planning perspective, the efficiency of the tractor drastically increased the productive range the agricultural worker could traverse in a day. The tractor-plowed landscape could be cognized as a vast territory of continuous fertile fields, commonly owned and worked without the historical divisions of contiguous family plots. All of these spatial repercussions are celebrated in the final minutes of *The General Line*. In shots montaged from various angles, the mass-produced steel wheels of a Fordson tractor approach, knock down, and snap the hand-hewn branches that formerly marked individual plots. Once the clearing is accomplished, a fleet of tractors engages in a remarkable choreographed dance. They begin in a rigid line at the top of the shot, and one by one, they roll diagonally across the field joining rank to inscribe a perfectly plowed circle so large that it exceeds the limits of the camera’s viewfinder by the end of the sequence (Figure 3). As the tractors altered the landscape beyond the frame, a new boundless scale was planted in the Soviet imagination, one that coincided with the diffuse patterns in the Plan’s graphic representation.
The Soviet tractor was among a small number of industrial products that carried specific objectives in the first, 1928 version, of the first Five-Year Plan, even though its critical role in agricultural collectivization had not yet been formulated. Throughout the early and mid-1920s, tractors were few and far between in Soviet territories. Only 177 tractors existed in the entire Soviet Union in 1922, a fleet that could cover just 0.02% of arable land. By the end of the 1920s, imports had increased the number of tractors on the ground, but additional machines did not change the complexion of Soviet agriculture appreciably: in 1928, still only 1% of agricultural land in the Soviet Union was sown by tractor.

Before 1929, the Soviet Union relied almost solely upon imports of tractors from the United States. The Ford Motor Company alone sold 20,000 tractors to the USSR in the four-year period from 1922 to 1926, and by 1927, 85% of all Soviet trucks and tractors had been built in Ford’s Detroit factories. Importation was so expensive, and the number of tractors so insufficient, that Soviet industry took measures to produce local versions of the coveted machines. When Charles Sorensen, one of Henry Ford’s deputies, traveled to the USSR in 1928, he toured the famed Putilov Steel Works in Leningrad. What he saw on the factory floor was one of Ford’s patented products, the Fordson tractor, dissembled and copied. But because local engineers could not recreate the precise forging process required for each steel component, the Soviet Fordzon-Putilovets tractors produced by reverse engineering fell apart as soon as they hit the fields. After three years of trying and failing to replicate American tractors within Soviet walls, the Soviet government decided to import the factory itself.

A high-ranking delegation from the VSNKh visited the United States in 1928, and sought out architect Albert Kahn in his Detroit office. Kahn’s work for Henry Ford at the River Rouge auto plant was well known to Soviet development experts. The firm had a reputation for turning out flexible industrial complexes, the design of which was driven not by aesthetic concerns, but by the exigencies of assembly-line production. The firm was also exceedingly efficient. In the 1920s, Kahn’s staff of over 400 employees included architectural designers and draftsmen;
structural, mechanical electrical, and ventilation engineers; specification writers; estimators and expediters; field superintendents, and office workers. Kahn’s organizational structure permitted all departments to work simultaneously and coordinate in an ongoing, fluid process. Architectural, technical, and specification documentation for a single plant could be produced in one month, and a completed factory could be up and running six months after the contract was signed between architect and client. His firm’s efficiency, coupled with technical know-how gleaned from his work for Ford, made Kahn a very attractive potential consultant in the context of the tempo set for Soviet industrialization.

In early 1929, Albert Kahn, Inc., signed a $4,000,000 contract to design a single tractor plant for the southern Russian city of Stalingrad, one that would produce 40,000 tractors annually. The Economic Review of the Soviet Union, an English language publication issued by Amtorg, the first Russian trade organization in the United States, noted in June 1929 that to supplement the expected output at Stalingrad, additional tractor plants would produce 100,000 Soviet-made tractors by the end of the first Five-Year Plan. Kharkiv was to produce 3,000 heavy tractors toward that goal, conceivably in the tractor division of the extant Kharkiv Locomotive Factory. By October, the Economic Review reported that “based on the demand of the newly organized state and collective farms,” the Chief Machine Building Administration had increased tractor quotas. Additional tractor factories would have to be built swiftly, preferably in the Central Black Earth region or the broadly defined South. The Kharkiv Locomotive Factory would be reconstructed to increase output from 5,000 (an unexplained increase of 2,000 from June) to 10,000 tractors annually, and total tractor production in the USSR would reach 245,000 by the end of the Plan. This accounted for an overall 250% tractor production increase from estimates published just four months before (Figure 4).

Concurrent events in the countryside just outside of Kharkiv put the astronomical tractor production increase in context. In October 1928, the Ukrainian Council of People’s Commissars

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**Figure 4.** Tractor output projections for Kharkiv, 1929.  
Source: Diagram by author.
announced that new tractor allocations for the spring sowing season were insufficient simply to replace the hard used and poorly maintained tractors that had gone offline that year.\textsuperscript{19} Soviet tractors needed to be produced en masse, which meant that Soviet tractor factories needed to be built immediately. A standard tractor factory type had to be devised, one that could be readily replicated like the Fordson itself.

**Standardization and Speed: The Establishment of Socialist Types**

Soviet architectural theoreticians and practitioners expressed a deep interest in American-style construction standardization early and often. The editors of *Contemporary Architecture* (*Sovremennaya arkhitektura, SA*), for instance, repeatedly praised American engineers (but not American architects) for their rational, efficient, and functional approach to design. In the opening editorial of *SA*’s second year of publication, the editors noted that while the social task of Soviet architecture was obviously more complex than that undertaken by the Americans,

> the similarity [between us] lies in the fact that modern architects, like American engineers, build their work on the basis of the highest level of modern technology. Amateurism is unacceptable for us as it for them, although we unfortunately, and almost constantly, have to deal with it. And we are absolutely not afraid to use the achievements of American technology, transferring them to make them our own, just as the Soviet Union does not think anything of importing American tractors and machinery.\textsuperscript{20}

Like the administrators ordering tractors and machinery, Soviet architects viewed American technological products as ideologically neutral, capable of being assumed, modified, and transformed into tools for the production of socialist space.

Amtorg, the driving force behind the Kahn contract, published *American Engineering* (*Amerikanskaia tekhnika*), a monthly Russian language magazine devoted to American technology and industrial practice with 5,000 Soviet subscribers.\textsuperscript{21} The regular half-page advertisement in *Economic Review of the Soviet Union* claimed that *Amerikanskaia tekhnika* was “helping to win the large Russian market for American industrial equipment,” an assertion that was likely accurate.\textsuperscript{22} Soviet architects and engineers thus became acquainted with western standardized building products, even though it would have been considered a folly to specify them in small-scale Soviet projects in the 1920s.

But Soviet designers and economists understood the achievements of western technology—American and German specifically—to exceed material products. Technology also encompassed the standardized design processes that made western industry so efficient. In an article on the urban housing crisis, architect G. Vegman provided data on the abysmal per capita living area allotted to each Soviet citizen. Architectural standardization needed to be immediately established, he argued, to economize on much-needed residential construction. “The consolidation and concentration of construction organizations, and the establishment of types, are the essential prerequisites to reduce the cost of construction,” Vegman wrote.\textsuperscript{23} The only way to solve the housing problem was to devise rational, replicable unit and building types.\textsuperscript{24} In January 1928, the Building Committee of the Russian Republic (*Stroitel’nyi komitet, Stroikom*) was established, with the express charge to “regularize and rationalize” construction affairs within its territory.\textsuperscript{25} Stroikom tapped *SA* editor and architect Moisei Ginzburg to head Section II, the “Typification Section” (*sektsiiia tipizatsii*). Ginzburg’s team addressed questions of architectural type, development of design standards, and training and qualification of technical personnel. Over the next few months, the section designed a handful of standard residential unit types. Although only six buildings utilizing the Stroikom units were built, the practice of designing architectural types that could be deployed across Soviet space was established.
Despite the work of the Stroikom Typification Section, design and construction standardization did not occur fast enough to meet the schedule set by the first Five-Year Plan. Progress toward the Plan’s ambitious capital construction goals was repeatedly thwarted by myriad shortages: insufficient technical drawings, building materials, skilled foremen, and laborers. In response, in August 1929, Stroikom issued a series of directives intended to usher the Soviet planning and construction industries into a new, more rationalized era. The People’s Commissariat for Internal Affairs (Народний комісariat внутрішніх дел, NKVD) was to develop planning regulations for urban environments, and the newly established Commissariat of Agriculture and Food (Народний комісariat землеробства, NKZ) would set regulations for agricultural stations. A separate section of the directive addressed “typification, normalization, and standardization of building design” through four requirements. First, Stroikom instructed governmental departments to develop standard types for buildings under their purview, draft measures to implement these types, and to ensure that they were being utilized in “real projects” by a set date. Second, building types necessary for the first Five-Year Plan (especially industrial facilities) would be developed and immediately put into use. Third, nonindustrial programs such as housing and sociocultural facilities would henceforth be constructed only upon types preapproved by Stroikom. The fourth and final issue stipulated that by the end of the Plan, all design would occur within state-run offices.

On December 26, 1929, two concurrent decisions pushed the Soviet construction industry toward a model of internationally assisted national standardization. Publically, the Council of People’s Commissars (Совет народних комісарів, Sovnarkom, the highest Soviet governmental organ) issued a decree, “On measures to cure the ills of building affairs,” that commanded immediate institution of rationalized professional practices through a series of directed efforts. A special standardization institute would be formed posthaste. To increase the tempo on typification for both structures and building processes, albums of type-projects would be published and widely distributed. Foreign specialists would be invited to work on particular projects, engage in professional exchange, and share technical expertise. “With the assistance of the organization of international technical offices,” Pravda reported, “foreign firms and specialists will be entrusted to the construction of individual factories. It is also considered expedient to attract a few engineering-construction firms to open branches to the USSR.”

The same day, behind closed doors, the Sovnarkom signed off on a draft for an expanded contract with Albert Kahn, Inc. Under the new agreement, Kahn’s firm would direct the design and supervise construction for all industrial projects in the USSR for a period of two years. In his previous contract with the Soviet government for the design of the Stalingrad Tractor Factory, Kahn retained rights to the architect’s instruments of service—drawings, specifications and the intellectual property contained in the design—as is common practice in United States. Under the new agreement with the Soviet government, Kahn’s firm would provide to its client, the VSNKh, “standard factory layouts, detailed drawings, specifications, and other technical documentation ‘typical for architects working in America,’” all of which would become the lawful property of the VSNKh at the end of the term.

The importance of this proviso, and the timing of the agreement, cannot be understated. When Kahn signed the expanded contract on January 9, 1930, the Stalingrad Tractor Factory was nearing completion: the first “International” model tractor rolled off the line six months later. The Wall Street stock market crash just two months before the contract signing also threatened the future of Kahn’s work in the United States. Although the Stalingrad factory was designed under the restrictive American-style contract, once the client-favoring agreement was put in place the Stalingrad blueprints seem to have fallen under the new legal regime. Just nineteen days after the expanded contract was inked, construction began on a new Soviet tractor factory outside Kharkiv, the capital of the Ukrainian Socialist Republic. It was to be an exact copy of the Stalingrad factory.
Ukrainian Tractors and Stalinist Tempo

KhTZ was not included in the initial version of the first Five-Year Plan published in 1928. But then again, neither was industrialized agriculture, at least not on the scale instituted after the grain crisis of 1929. The circumstances and the timeline of KhTZ’s inclusion in the modified Plan are worth looking at in some detail, for they reveal the mercurial and ultimately frantic nature of economic decision making during the early stages of the Plan’s fulfillment. This single capital construction project also demonstrates how particular sites became implicated in the Union-wide race to Soviet industrialization and further, how architectural strategies like standardization became invaluable to meeting the Plan’s goals.

In November 1929, the Ukrainian branch of the State Engineering Institute for Metallurgical Plants (UkrGipromez) submitted a memorandum to the VSNKh titled “The choice of Khar’kov [sic] as the site for the construction of a southern tractor factory.” The report was a feasibility study that interrogated various possible locations within the Ukrainian SSR. Without preamble, the document opened with a list of preconditions for the projected factory:

1. Guarantee of a fifteen-month construction period, in agreement with the directive provided by the highest economic bodies, such that the construction of the factory will be complete in the fall of 1931.
2. Guarantee that even given this short period, full production will be met within a period of two years—that is, in 1931-1932, the factory will turn out 30,000 units, and in 1932-1933, 50,000 units.
3. Achievement of minimum cost.
4. Possible reduction of capital expenditures.31

The first precondition set the nearly impossible schedule. When one calculates back fifteen months from the hard fall 1931 completion deadline, and notes the date of the internal report, seven months were all that remained to design and mobilize factory construction. In just over half a year, the drawings and site had to be prepared, and the management and labor pool gathered to build the factory and the adjacent residential settlement. The second precondition stipulated that production targets be met in a timely fashion. This requirement attempted to head off a problem common to accelerated construction jobs in the first Five-Year Plan. Namely, that pressured officials would declare a factory complete before it was truly ready for production. The Stalingrad Tractor Factory, although still under construction at the time the Kharkiv siting report was filed, fell victim to this temptation. Leon Swajian, the American foreman from Albert Kahn’s office who oversaw both the Stalingrad and Kharkiv construction sites, noted in 1931 that, “we learned a lesson from Stalingrad, which ‘opened’ more than a year ahead of schedule, but didn’t make many tractors. At Kharkov [sic] we’ll turn out a few tractors first, and then call her ‘open.’”32 The concern of the final two conditions was cost reduction, which would be difficult to ensure given the expedited construction tempo. Architectural standardization was the only solution that could meet all four preconditions, either through a fully shipped and ready project, like Stalingrad, or by recycling a preexisting design.

As the poor performance of the Fordzon-Putilovets tractor had demonstrated, only the installation of an all-inclusive, vetted tractor production facility could ensure a faultless end product. As soon as Kharkiv was chosen as the site, negotiations began between Traktorstroi, the Kharkiv-based organization set up to oversee the project, and the American company Caterpillar to deliver full plans and construction support for the Kharkiv factory. Kahn’s office appears not to have been involved in these discussions. Talks between Traktorstroi and Caterpillar broke down quickly over two crucial issues: cost and transparency. Traktorstroi’s executives were affronted most by the American company’s refusal to share industry secrets:
When a group of executives from Traktorstroi approached the owner of the American company “Caterpillar” with their proposal to order a project for the Kharkov Tractor Plant, the price quoted was 7 million rubles gold (!) and he agreed to develop and submit it to us only under the condition that Soviet representatives remain uninvolved in his enterprise, without the right to study the production or the machines (?!). These conditions were rejected, and technical “aid” of American capitalists was replaced with the study of other tractor factories in the USA.33

The exclamatory punctuation interjected in this Soviet version of the story underscores the misaligned expectations of the two parties. The first point of friction was the price tag for the factory design. After the grain crisis of 1929, Soviet currency reserves could not meet Caterpillar’s request of seven million rubles gold. In addition, the American firm correctly intuited that the Soviet objective in ordering a tractor plant in toto was to possess a replicable system of production. At such a price, the Soviet government expected nothing less than the keys to the whole industrial process.

The expanded design consultancy with Albert Kahn, Inc., was solidified just before the Caterpillar talks collapsed. In mid-April 1930, the Council of Labor and Defense (Sovet truda i oborony, STO) decided to change the tractor type at Kharkiv to the “International,” and to duplicate the construction and technological plans from the Stalingrad plant in order to speed up and reduce the cost of construction.34 By the time this decision was made, only eighteen months remained before tractors were expected to roll off the assembly line in Kharkiv. Even without clear planning direction, building materials were being “energetically” transported to the tractor factory construction site during the dead of winter. A brick factory was also built—purportedly in a record eighty-two working days—three kilometers away from the future factory site.35 Ultimately, the decision to build the Kharkiv plant as a duplicate of Stalingrad came so quickly on the heels of Kahn’s expanded contract, it seems likely that the decision makers at VSNKh and STO must have discussed the idea before the Kahn agreement was signed. Seen in this light, the accelerated completion schedule for KhTZ reflects how Soviet industrial planners had put their faith in standardization.

It is difficult to compare directly the design of the Stalingrad Tractor Factory with that of KhTZ because original Kharkiv factory drawings refuse to be found either in Soviet-era archives or Kahn’s Detroit office. But we can look carefully at the Stalingrad Plans from Kahn’s archive and hold them up to scraps of graphic and textual evidence that describe the factory complex at KhTZ. The Stalingrad title sheet shows that the tractor factory was composed of three large industrial buildings: a foundry, a forge shop, and an assembly building (Figure 5). The most distinctive building on the Stalingrad site is the forge shop, which consists of a narrow rectangular bar that holds the first heat treat attached to three perpendicular bars for the heavy and light forge shops and die machining. While the planometric idiosyncrasy of the forge shop plan is evident from an aerial view, the rationality of Kahn’s design is revealed in the plan’s structural grid. The building’s column lines, indicated by both horizontal and vertical dashed lines capped by circles, plat the site with a perfectly square six-meter grid. The neutral system, isometric in both directions, permits infinite expansion beyond the confines of the structure. The detached material storage building that sits to the south of the forge shop registers this infinite grid by snapping neatly into place. Kahn’s outward architectural signature is found in the building sections and elevations. The butterfly trusses, popped monitors, and saw-tooth skylights, known as the Kahn Daylight System, worked along with generously glazed elevations to provide a working environment filled with natural light from multiple directions.36

The dimensional precision and custom detailing in the Stalingrad drawings were quality-insured on-site by the material delivery system. The Stalingrad Tractor Factory was an imported artifact: an American produced erector set constructed largely by foreign workers under foreign supervision.37 The structural columns—designed with American steel profiles—were manufactured in the United
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States and shipped to the USSR, as were the trusses and the door and window frames, and all of the technical equipment to run the factory. The construction process at Stalingrad was intended to be as straightforward as matching the pieces to the drawings, hoisting the members in place, and securing the joints.

The only factory plans of KhTZ that have surfaced to date come from a 1962 book on the architecture of Soviet Ukraine, for which no architect was credited (Figure 6). The three-legged forge shop is the sole building illustrated, but it is well documented in a plan, long elevation, partial section and axonometric projection. The drawings and a photograph of the KhTZ entrance recall the Stalingrad factory, but the KhTZ buildings are notably heavier and more opaque. When the Kharkiv plan is placed on top of the Stalingrad forge shop plan, the building footprints perfectly align, as do the six-meter structural bays. The difference between the two lies in the exterior structural units, indicated on the Stalingrad plan as thin steel columns and on the Kharkiv plan as heavy bearing-wall sections. Photographs support this reading of the plan, as most KhTZ buildings are thick-walled structures with punctured window openings, not the steel-framed window walls of Stalingrad.

Two textual corroborations explain why such a significant material change—from steel to concrete structure—was made between the original factory and its projected twin. Leon Swajian, the construction foreman from Kahn’s office who was transferred to Kharkiv once Stalingrad was complete, noted in a 1931 interview that: “Kharkov [sic] was supposed to follow the designs made for Stalingrad, but this proved impossible. Imports of the steel had to be economized, so the Kharkov plant was built largely of reinforced concrete.” Contemporary Soviet analysis of the KhTZ project echoes this fact, but fills in the details. The economics of the duplicate factory did not permit import of all steel structural members, nor was the practice sustainable in the long

Figure 5. Forge shop plans, Stalingrad tractor plant, Albert Kahn, Inc., 1929.
Source: Albert Kahn Papers, Albert Kahn Associates, Inc., and the Bentley Historical Library, University of Michigan.
term. The nascent Soviet steel industry was incapable of providing identical steel sections to those designed for Stalingrad, or even the required amount of reinforcing bars for a fully concrete version of Stalingrad. As a consequence, KhTZ was effectively redesigned as a hybrid industrial complex that utilized three structural systems. According to the Soviet source, the forge shop retained its steel structure (although this claim must be questioned if the 1962 plan is to be believed), the mechanical assembly shop was built of reinforced concrete, and the foundry had concrete foundations topped by a steel structure. All remaining walls, and wall infill, were constructed of red brick produced at the new brick factory three kilometers from KhTZ.41

In the opinion of American foreman Swajian, KhTZ’s factory buildings were more difficult to build than Stalingrad’s. Not only was the primary material of the factory changed for the reasons outlined above, but the success of any material request hinged on uncontrollable supply factors. As Swajian noted, American engineers were “accustomed to a country where you can order anything you like one day and get it the next,” whereas in the Soviet context, the construction manager either had to anticipate long lead times and make early material orders or, on rushed projects like KhTZ, simply change tack. In the USSR, Swajian adopted a flexible management style to counter instability. “We must learn to take account of what material is available here, instead of imposing absolute standards,” he concluded.42 Swajian’s comments explode the outdated but persistent narrative of unidirectional technology transfer between the United States and the USSR. American efficiency and precision had to bend to Soviet contingency, as the foreman noted. But it is also evident that Swajian and other western experts acquired new skills of ingenuity and resilience during their Soviet tenure. Turning out a successful project in the young USSR required much more than competent administrative skills from the expert. Success hinged upon

Figure 6. Kharkiv tractor factory, no architects cited, 1929. Source: G. V. Golovko, ed., NarSYSyi Istorii Arkhitektury Ukrainskoi RSR (RadyANS’kyy Period), vol. 2 (Kyiv: Derzhavnaya vydavnitstvo literatury zd budivnictva i arkhitektury URSR, 1962), 70.
the ability of that expert to solve problems on the fly, to use the materials and labor at hand, and to work toward acceptable tolerances, not perfection.

**Priviazka, Brotherly Resemblance, and Tolerance**

A Soviet account, *Experience and Lessons from the Construction of KhTZ (Opyt I uroki stroitel’stva KhTZ)*, claims that the KhTZ factory complex was entirely redesigned by the Soviet engineers of Traktorstroi with guidance from future shop foremen. Setting aside the obvious propagandistic benefit of such a claim, the primary question it raises must be addressed. Given the significant changes that occurred between Stalingrad and Kharkiv, can KhTZ be considered evidence of standardization? The answer necessarily is tied to its Soviet context. Broadly speaking, the first Five-Year Plan was the accelerated Soviet effort to devise its own version of standardization, one that mapped on to the realities of a transitional context. Standardization came to mean something different in the Soviet Union: not duplication, but strategic reconfiguration of the original artifact to meet the conditions on the ground. Soviet standardization may have originated with the direct importation of western industrial materials, systems, and management styles, but it morphed through trial and error into a set of practices applicable to wildly varied environments—from industrialized Ukraine to the Ural steppe.

Unlike the emphatically precise American or Germans versions, the Soviet system of standardization was heuristic and flexible of necessity, forgiving of imperfect sites, supply chains, and labor conditions. The long-term implications of the tractor factory standardization experiment become clearer at the Union scale. Kharkiv was a model project for the *priviazka* system of typological replication that continued well after Kahn’s staff left the USSR in 1932. *Priviazka*, directly translated, means to bind, or lash one thing to another. In the Soviet architectural context, *priviazka* was the process by which a building type was tweaked to respond to specific site conditions. This Soviet version of standardized architectural production assumed that strategic local adjustments to the original type or model would be necessary, changes that would permit the two to bear a family resemblance even if the geographic, material, and labor conditions under which they were created differed drastically. As Yves Cohen aptly noted in his study comparing the American and Soviet versions of Ford tractors:

> Compared side by side, a *Fordson* and *Fordzon-Putilovets* resembled each other like brothers. At this level they were standard products; the artifact was well copied. At another level, the parts and the mechanical assemblies resembled each other, but there the resemblance ended.

I do not at all mean to say that standardized products have to be identical. On the contrary: it is this very paradox of mass production that Henry Ford was the first to solve; to be identical at the level of the complete product, its constituent parts need to not be identical.43

Cohen stressed that standardized products need not be identical; what is important to control in the process of replication is **tolerance**, a reasonable distance between the original and its copy, such that the two act satisfactorily alike. In the case of the *Fordzon-Putilovets*, external tolerance was acceptable for propagandistic purposes. A photograph of a Soviet-made *Fordzon-Putilovets* plowing collectivized fields was good enough for Stalin to claim socialist cooptation of American technology. As Ford’s colleague Sorenson found, however, poor manufacture of mechanical parts rendered the internal tolerance of the *Fordzon-Putilovets* unacceptable. The *Fordzon-Putilovets* might have looked like a Fordson, but it didn’t act like a Fordson. Soviet standardization of the American tractor was a failure.

Given the dissimilarities between Stalingrad and Kharkiv, can these factories be summoned as early evidence of Soviet standardization, or *priviazka*? Cohen’s notion of tolerance is a
helpful means to answer this question. If judged by external tolerance, Kharkiv was a poor copy of Stalingrad. The structural systems and material constitution of the two factories differed so greatly that the buildings could never be mistaken for one another on the ground. But a close look at the architectural DNA of the buildings, their plans, reveals that the forge shops, at least, were typologically identical. Since the task of the factories rested on spatial congruence, not appearance, internal tolerance was well within acceptable limits. KhTZ might not have looked like Stalingrad, but it acted the same. Soviet standardization of the tractor factory was a success.

Another way to assess whether KhTZ is an example of architectural standardization is to ask the architect of the original. Would Albert Kahn, well versed in Ford’s philosophy of mass production cited by Cohen above, have considered Kharkiv his own project, despite the copious material changes made to the copy? In fact, he did. In a 1939 American monograph titled *Industrial Architecture of Albert Kahn, Inc.*, a double-page spread illustrates a map of the world peppered with cities in which Kahn architecture resides (I have named it the Albert Kahn, Inc. “world domination map”)44 (Figure 7). Kahn’s projects are found on all six habitable continents, with the United States and the USSR sharing the highest density of building. Stalingrad, Kharkiv, and Cheliabinsk (the site of another tractor factory constructed on the same basic plan) are all indicated as Kahn sites.

In total, Kahn office records confirm that 531 factories based on their drawings and specifications were completed in the USSR by the time the two-year consultancy was over, and more than 4,000 Soviet technicians were trained by Kahn management in Detroit, Moscow, and in the satellite construction offices.45 The number of unconfirmed facilities based on plans or details developed by Kahn’s office—*priviazka* copies of brotherly resemblance—will probably never be known, but his architectural firm, still operating in Detroit, estimates that it is likely in the thousands.

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*Figure 7. Albert Kahn, Inc., “world domination map.”
New Kharkiv: Experimental Socialist Settlement Model

KhTZ comprised three interdependent programmatic spheres. The tractor factory occupied the industrial sector. The residential sector was made up of the workers’ sleeping quarters in multi-story apartment buildings. The sociocultural sector was everything else—all of the support services that a socialist settlement needed to provide, including communal dining facilities, mechanical laundries, childcare facilities, clubs, libraries, theaters, gymnasiums, sporting fields, and state-run shops. The socialist city, or sotsgorod, was the combination of the latter two sectors. From February 1930, planning materials for the so-called New Kharkiv sotsgorod issued from the Sector for Rationalization, Standardization, and Reconstruction of the Communal Economy of the Ukrainian SSR NKVD (sector ratsionalizatsii, standardzatsii i rekonstruktsii kommunal’nogo khozaistva).46 Ukrainian architect, Pavel Aleshin, led the sotsgorod design team.

If we peer into the KhTZ site plan and envision separate design teams working away on their dashed boxes—factory, sotsgorod—we can imagine each team focused inward on the discrete problem posed to it. Both Traktorstroi engineers on the north of the site, and Pavel Aleshin and his colleagues on the south, engaged standardization as the single most plausible architectural strategy given the abbreviated time frame in which they had to complete their design tasks. Tractor factory designers devised an adjusted model that closely resembled its predecessor at Stalingrad. In the very process of priviazka—binding the American design to match the conditions on-site—the engineers devised a Soviet version of standardization that worked within the highly contingent context of Soviet industrialization. With the KhTZ sotsgorod, on the contrary, Aleshin’s design team had to invent an original, and replicable, social-industrial settlement model. They were on the front lines of settlement standardization, taking cues from design work for the tractor factory as well as ongoing design for Magnitogorsk and other Soviet industrial settlements under formulation.

The months from late 1929 to mid-1930, when the New Kharkiv sotsgorod was being designed, coincided with the most active period of the socialist settlement debate. Among the theoretical tracts published in just this small window of time were Toward the Problem of Constructing the Socialist City (Gosplan), Cities of the Future and Socialist Cities (Sabsovich), and Sotsgorod (Nikolai Miliutin). All of these texts, and the vigorous public discussions that accompanied them, laid the intellectual groundwork for how design might transform society. But more often than not, their authors stopped short of formal recommendations and well short of nuts-and-bolts design detail. Stalingrad, KhTZ, Magnitogorsk, Nizhnii Novgorod (Gorkii), and a handful of other swiftly constructed industrial settlements were the testing grounds for replicable settlement models.47

KhTZ was the perfect site for experimentation. Located ten kilometers from Kharkiv’s traditional urban center, it was close enough to take advantage of the city’s connectivity and skilled working population, but isolated enough on the agricultural outskirts to be free from the difficult charge to address existing city fabric. This geographic remove also permitted the New Kharkiv sotsgorod to act in its first years as an “enclave” per Gramscian definition, a wholly designed community in which the social relations of everyday life could be altered under perfect laboratory conditions.48 Nikolai Miliutin, economist turned architect, may have provided some guidance to the KhTZ design team in the following passage of his theoretical text, Sotsgorod, published during their design effort. Miliutin wrote,

Expansion of existing settlements, if it turns out to be absolutely necessary, must be done either by creating satellite towns, or by replanning these settlements...based on those principles by which we build new ones, i.e., affording maximum dispersion of the population, and creating the premises for the organization of a new way of life.49

Detachment from traditional urban culture, in other words, was key not only to provide freedom to experiment with new architecture and spatial forms of settlement but also to cultivate the first
green shoots of communal conduct. An early brief for the New Kharkiv sotsgorod described what its designers hoped to accomplish along these lines. “[Our newly constructed] cities will be designed . . . to serve specific industries and constitute finished complexes of interconnected enterprise. Socialist cities are complete organisms, conceived and calculated from the beginning to the end.”50 In this formulation, the factory and its sotsgorod were inextricably linked, designed concurrently as “complete organisms”—holistic and replicable socioindustrial models.

The first rendered site plan of New Kharkiv shows the sotsgorod in a future build-out phase51 (Figure 8). The plan is divided into three horizontal zones: heavy rail to the north with the tentatively penciled factory just below, local transportation corridor and 500-m green band, and finally the residential sotsgorod comprised of vertically rectangular repeated zhilkombinaty (“living combines” or residential blocks) marching south from the green zone and faintly but insistently eastward, in promise of further colonization of the countryside. There are just two prototypical block designs in use here, and they appear at this tiny scale to utilize the same few building types. Building types come into clearer focus in an evocative aerial perspective of the first zhilkombinat (Figure 9). Two narrow six-story bars hold dormitory-style living cells for singles. Six four-story bars hold multiroom family units. In the middle of the composition sits a round-nosed workers’ club attached to a communal dining hall and mechanized laundry. Four educational buildings—elementary schools, kindergartens, and crèches—line the back of the block. With some necessary adjustments from drawing to construction, this was the urban unit built at New Kharkiv, and one that served as a model for integrated residential blocks installed throughout the Soviet sphere.

The speed with which the working drawings for the New Kharkiv sotsgorod were produced suggests that the project proceeded along a straight path to completion. Yet Aleshin lamented...
after the project was finished that “shock-work” conditions paired with fluctuating theoretical imperatives took a toll on his team (Giprograd):

From the list of work completed by Giprograd on the Tractor Factory project, it is evident that there was an extremely unclear sense of what the buildings should be, a lack of any material standards for designing the transitional [socialist] city and extremely diverse ideological positions in the various currents within Ukraine and all over the Union. Under these conditions, Giprograd engaged in a rather unexpected agreement not only to study the materials available at the end of 1929 and early 1930, but also to develop new facilities regarding the everyday way of life (*byt*) in all of its manifestations: housing, childrearing, education, nutrition, exercise, medical care, recreation, etc., in terms of architectural design.

Under shock-work construction conditions, Giprograd took full responsibility for the immediate fulfillment of its design obligations. Giprograd was forced to perform these tasks in the shortest possible time frame by going ahead of other similar construction projects, and without the benefit of other examples of sotsgorod construction.52

First, Aleshin made clear that there was no roadmap for the design work that his team undertook at New Kharkiv. Urban theorist Sabsovich had coined terms for new architectural ensembles and objects—sotsgorod, zhilkombinat—but there was no clarity on their material constitution. Aleshin and team had to cycle through trial and error design. Their project was experimental in the fullest sense: the designers understood that they were devising a new model for socialist urban form. Second, to become conversant in the terms of the unfolding socialist urbanism

*Figure 9. Perspective view of the standard zhilkombinat model, KhTZ sotsgorod, 1930.*
Source: Tsentral'nyi derzhavnyi arkhiv i muzey literatury i mystetsva Ukrainy/Central State Archives and Museum of Literature and Art of Ukraine, TsDAMLM, f.8, o.1, d.263.
debate, Aleshin and his team engaged in intense research. The vigorously annotated books on the
debate in Aleshin’s personal library testify to the architect’s deep engagement with the theoretical
material. He became so well acquainted the material of the socialist urbanism debate over such a
short period of time—tracking the protagonists and their arguments, testing them against his
team’s ongoing work to design a material environment—that he was in a position to be critical of
implausible recommendations. He made a point in his letter to mention his pleasure at reading the
Central Committee’s “Resolution on the work to restructure byt,” from May 16, 1930, that
admonished “left-wing distorter” Leonid Sabsovich by name. Sabsovich’s “extremely unreason-
able semi-fantastic schemes” that sought “to attempt in ‘one jump’ to clear those obstacles to the
socialist reconstruction of byt,” were exactly the types of recommendations that “unnerved”
Aleshin and his design team. The theoretical ground was shifting, and yet for Aleshin and team,
the deadline had to be met.

Luckily for Aleshin, the New Kharkiv sotsgorod design was deemed a positive exemplar for
future sites, in line with the official position on socialist settlement. Grigol Ordzhonikidze,
Politburo member and soon-to-be Commissar of Heavy Industry, reviewed the preparatory work-
ning drawings for New Kharkiv in 1931 and stated that the project “fully met the needs of the
given period.”

Conclusion: Socialist Urbanization through Standardization

KhTZ is just one important experimental design project undertaken during the first Five-Year
Plan that brings into stark relief the degree to which Stalinist tempo forced the hand of project
administrators, and the designers they employed, to devise new industrial-residential settlements.
Design standardization was pursued as the primary strategy for meeting the Plan’s capital con-
struction goals because time did not permit design for difference. Once types and models were
successfully deployed on test sites like Kharkiv, they were codified as loosely repeatable mod-
ules appropriate for socialist industrial growth in other less networked sites.

Standardization was a central preoccupation of Soviet architects, planners and governmental
officials during the first Five-Year Plan, although the reasons for pursuing architectural standards
sprung from differing concerns. For Soviet architects, to embrace standardization was to embrace
rationality, new technology, and to assist in the construction of environments appropriate to the
new socialist way of life. Thoughtfully designed cities, neighborhoods, buildings, housing units,
and domestic objects, created with industrial replication in mind, could be produced inexpen-
sively and disseminated quickly. Soviet architects’ embrace of standardization may also have
been an act of self-preservation to stay relevant in a society hell-bent on industrialization. For
Soviet construction administrators, standardization was also a matter of self-preservation. The
tempo of the first Five-Year Plan pushed industrial planners to accelerate project delivery.
Standardization was a way to speed construction, ensure a degree of quality, and to conquer the
otherwise uncontrollable vastness of Soviet space. An aspirational ink spot on the map of the first
Five-Year Plan could be instantiated as an industrial enterprise through the deployment of reli-
able and replicable architectural types and models. The first Five-Year plan was a colonizing
project to expand Soviet networks of transportation, energy, and material. Its most elemental goal
was to plot dots on the map and connect them into a productive web.

Two types of western standardization—architectural and managerial—were assumed by
the Soviets during and after the conclusion of the first Five-Year Plan. First, standard western
architectural details, plans, sections, and entire multibuilding projects were absorbed into
everyday Soviet design practice. As promised by the Sovnarkom in December 1929, “typifi-
cation” was accelerated by the publication of books like the 1933 Modern Prefabricated-
Factory Architecture (Sovremennaia fabrichno-zavodskaiia arkhiitektura) by professor D.
Tsvetaev. This manual, full of architectural details of the “American type” was pulled from
the shelves in the later 1930s when the story of American involvement in Soviet industrialization was no longer ideologically palatable, but the renamed details remained in circulation.\textsuperscript{56} Second, centralized design organization, pioneered in Kahn’s Detroit office, was quickly adopted as Soviet managerial standard.\textsuperscript{57} Just one Soviet example, the State Institute for City Planning (\textit{Gosudarstvennyi institut po proektirovaniiu gorodov}, Giprogor), founded in 1929, employed within a single agency architects, transportation engineers, and sanitation experts among other specialists.

Most importantly, out of this period a distinctly Soviet type of standardization emerged: \textit{priviazka}. When KhTZ was nearing completion in 1930, People’s Commissar for External and Internal Trade, Anastas Mikoyan, laid out the official Soviet stance on standardization going forward. Mikoyan was well-acquainted with American industrial practices, but believed that only under a planned economy would standardization be optimized.

If we had such technology as America has, we would succeed fully in realizing a system of mass production and standardization and we would reduce wastefulness in the economy to nothing, for there are social barriers in our way...When we overcome technical backwardness then doubtless we shall achieve colossal results. We will have a planned economy, high technology, mass production, standardization and specialization of plants as well as regions.\textsuperscript{58}

In Mikoyan’s view, once the planned economy and mass production successfully were combined, the Soviet technology would leapfrog American technology. Mikoyan went so far as to implicate national space in his long-term standardization schema. He envisioned not only factories, like KhTZ, but whole regions planned as standardized units.

While the Stroikom Typification Section engaged typology at the discrete scale of the living cell, standardization of larger urban unit types and models—the factory complex, the neighborhood, the city—did not emerge until the first Five-Year Plan’s crisis of manufactured deadlines. In September 1930, the Stroikom Typification Section transformed into the Socialist Settlement Section of the Gosplan RSFSR Building Division (\textit{sektsiia sotsrasseleniia stroysektora gosplana RSFSR}).\textsuperscript{59} As the abstract diagrams from this short-lived effort reveal, the work of the Socialist Settlement Section skipped the middle scale of site planning, and moved directly to the regional scale. Replicable urban models perform, however, at the middle scale—what we now call urban design—where architecture and the particularities of site remain material and legible. As a result, the Socialist Settlement Section’s work had limited impact on the design of actual sites like KhTZ undergoing planning at that time. Practitioners like Pavel Aleshin had to devise socialist urban units like the \textit{zhilkombinat} at New Kharkiv on-site. This experiment in turn became a tested model suitable for replication, \textit{priviazka} adjustment, and export to other sites.

By late 1931, with a deeper collective understanding of large-scale planning issues, Giprogor, the new State Institute for City Planning, began to work out the theoretical and methodological issues related to socialist settlement by applying the practice of standardization to the problem of settlement types.\textsuperscript{60} The Soviet desire to replicate industrial concerns and residential quarters quickly across vast territories met success, finally, through the interscalar standardization of architectural details, standard building types, and predesigned settlement modules. The diffuse settlement diagram forwarded by socialist urban theoreticians was made manifest by standardized objects and modules planted across the Soviet landscape.

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Notes


2. Although the most typical Anglicized version of the city is *Kharkov* (a spelling used sporadically in archival documents), and *Khar’kov* as transliterated with the Library of Congress standard, I have used here the current, Ukrainian spelling of *Kharkiv* throughout.


4. An excellent discussion of both *circulation des savoirs* and *histoire croisée* as applied to the Soviet case can be found in Yves Cohen, “Circulatory Localities: The Example of Stalinism in the 1930s,” *Kritika: Explorations in Russian and Eurasian History* 11, no. 1 (Winter 2010), 11-45.


6. L. M. Sabsovich, *Goroda Budushchego I Organizatsiia Sotsialisticheskogo Byta* (Moskva: Gosudarstvennoe tehknicheske izdatel’svo, 1929), 48. All translations from Russian by author unless otherwise noted.


9. “The revolutionary pathos and Promethean arrogance of this dream [of rapid electrification of the Soviet Union] were put on full display in 1920, when before an assembled audience in the Kremlin, Lenin demonstrated by means of a huge map of the country, studded with bulbs, how electrification would look. During the demonstration, all the electricity in the city of Moscow had to be cut off to provide sufficient power for this show.” Richard Stites, *Revolutionary Dreams: Utopian Vision and Experimental Life in the Russian Revolution* (New York: Oxford University Press, 1989), 48.

10. In total, forty-four industrial products carried specific objectives in the Plan, but only eight were mechanical products, a category into which the tractor fell. Yves Cohen, “The Soviet Fordson: Between


12. Ibid., 118.


14. Sorenson’s host from Vysshii sovet narodnogo khoziaistva (VSNKh), vice-chairman Valerii Mezhlauk, along with Saul Bron from the American-Soviet trade organization, Amtorg, brokered the agreement with the Ford Motor Company to assist with construction for the Nizhnii Novgorod auto factory in 1928.


17. TsDAML (Tsentr’nyi derzhavnyi arkhiv-muzei literatury i mystetsva Ukrainy / Central State Archives and Museum of Literature and Art of Ukraine), f.8, o.1, d.259, ll.2-31.


21. Russian émigré engineer, Walter Polakov, founded the magazine in 1924, under the aegis of the Association of Russian Engineers in America. He and other engineers wrote the technical articles in Amerikanskaia tekhnika to share the latest American industrial products and organizational practices with their Soviet counterparts. Polakov knew Russian industry well: he had been educated in his home country and had worked in Russian factories until fleeing during the 1905 revolution. He became an ardent follower of Frederick Taylor in the 1920s and 1930s, and returned to the Soviet Union as a technical consultant from 1929 to 1931. Bailes, “The American Connection,” 437.

22. Economic Review of the Soviet Union, January 1, 1929, 27. The half-page advertisement can be found in most issues of the Review.


24. In response to Vegman’s plea, SA launched the “Comradely Competition for Communal Housing” in late 1927 as a way to brainstorm new standardized residential units within the socialist framework. For a full discussion of SA’s competition for communal housing and its aftermath, see Christina E. Crawford, “The Innovative Potential of Scarcity in SA’s Comradely Competition for Communal Housing, 1927,” archiDOCT 1, no. 2 (2014), 32-53.


27. The Narodnyi komissariat vnutrennikh del’ (NKVD) is best known in Soviet history as the secret police and the precursor to the Komitet gosudarstvenoi bezopasnosti (KGB). In the 1920s, however, the NKVD was more strictly an interior ministry without police functions. The Narodnyi komissariat zemeledel’ia (NKZ), on the contrary, was established in 1929 as a Union-wide ministry responsible for the planning and management of agricultural production in the entire USSR. Its charge was to oversee agricultural collectivization and ensure procurement targets.

28. The decree was summarized in Pravda, December 29, 1929, in an article titled “The Reorganization and Improvement of Construction.” A list of all of the issues addressed in the decree included the need for mechanization of construction work, standardization, industrialization of building materials, skilled work cadres, professional exchanges with other industrialized nations, use of foreign technical expertise, the organization of manufacturing in construction work, establishment of construction firms and branches, management and planning of the construction industry, and decrease of the cost of construction. This directive is also discussed in Catherine Ann Chichester Cooke, The Town of Socialism (Cambridge: University of Cambridge, 1974), 166-67.


31. TsDAMLM, f.8, o.1, d.259, l.1.


34. Ibid., 9.

35. Ibid., 8.


41. Baltuzevich, *Opyt I Uroki Stroitel’stva Khtz*, 10-11. The text notes that the choice of brick for the structure of the buildings in the sotsgorod was also determined by the proximity of the brick factory.

42. Swajian, “Building the Kharkov Tractor Plant.”


46. It is unclear whether this is a newly formed Ukrainian branch of the special standardization institute promised by the Sovnarkom directive in December 1929, but the name relays the intent to bring efficiency to all architectural projects nonetheless. Tsentral’nyi derzhavnyi arkhiv vyshchyh organiv vlydy ta upravlinnia Ukrainy [Central State Archives of Supreme Bodies of Power and Government of Ukraine, TsDA VO], f.5, o.3, d.2085, ll.13-25.

47. For the Nizhni Novgorod (Gorkii) planning efforts of this period, see Heather D. DeHaan, *Stalinist City Planning: Professionals, Performance, and Power* (Toronto: University of Toronto Press, 2013).


50. This sotsgorod program issued from the Higher Technical-Construction Committee of the NKVD Ukrainian SSR. TsDAVO, f.5, o.3, d.1877, ll. 1-2.

51. There are roughly thirty-eight zhilkombinat blocks in this site plan. If each held 1,500 residents, this plan would support a sotsgorod population of 57,000, a number well in excess of the original demographic target of 36,500.

52. TsDAMLM, f.8, o.1, d.265, ll.4-5.


54. TsDAMLM, f.8, o.1, d.265, ll.4-5.


57. “All departments start work simultaneously instead of working in successive stage, and this, in addition to speeding up the work of making the drawings, means that plans and specifications for all trades
can be submitted for bids at one time, thus enabling the client to determine the cost of the building in its entirety before starting to build.” This organizational model was also utilized in the Kahn Moscow outpost of Gosproektstroi. Nelson, *Industrial Architecture of Albert Kahn, Inc.*, 19.


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