Surviving the Pacific War Torch: The Cyclical Revitalization of Nagoya from Meiji Restoration to 1960

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Abstract

By the end of the twentieth century, the city of Nagoya was a major core of Japan's automotive, aerospace, ceramics, and machinery industries. Nagoya has not always been such a hub. Prior to the war in the Pacific, the main industry was textiles, predominately pottery and loom work until the 1930s. The start of the Fifteen-Years War created a need for heavy industries to take over led by the production of Mitsubishi's fighter planes. In 1945, American forces used strategic bombing to fire-bomb Japanese cities to diminish military factories and citizen moral. Nagoya is typically overshadowed in the fire-bombing campaign by other cities such as Tokyo, Osaka, Yokohama, and Kobe. This paper will demonstrate how Allied bombing was a transformative incident in the economic history of Nagoya, and how this catastrophe set way for the modern urban economy. By chronicling the city's economy before the war, showing the extent of the destruction caused by the bombings, and exhibiting the reconstructive efforts, the impact of Allied bombing can be assessed. The key objective this paper supports is how in-spite of experiencing a horrific tragedy, Nagoya was able to benefit from it as it was given a fresh start to revamp its entire economy as the city progressed into the latter half of the twentieth century.

Keywords: Nagoya, Aichi Prefecture, Pacific War, Strategic Bombing, Urban Economy

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Introduction:

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Disasters, both natural and man-made, can have devastating impacts on cities, the inhabitants that reside there, and the economies that surround them. This is not unlike a forest fire that leaves the landscape charred and barren of life. However, like a fire that burns accumulated underbrush the destruction can give way to an invigorated rebirth and renewal. Kostof writes that "The transformation of London from a medieval half-timbered warren into a Renaissance city of paved streets and brick buildings began in a baker's house on Pudding Lane around 1 a.m. Sunday, 2 September 1666."[1] The Great Fire that scorched 13,000 homes, civic buildings including the Royal Exchange, Customs House, and Guildhall, and eighty-seven churches including St. Paul's Cathedral.[2] The economy was severely crippled by the lack of urban revenue and scale of physical destruction. This destruction did not result in the abandonment of the city or its demise as a center of influence. On the contrary, the reconstruction of the urban space, and its economy resulted in a stronger and more enduring city that continues to be one of the centers of global finance. Nearly three centuries after the Great Fire of London, many Japanese cities endured similar destruction. The origins of the conflagrations were not from a baker's house but the bomb bays of American B-29 aircraft. The devastation was acute and horrific leaving large swaths of cities as smoking heaps of rubble. As with London, these cities rose again. The success of Toyota Automotive Company from these vicious Pacific War bombings stands as an example of global economic triumph that has grown from the resurrection of the oft-disregarded city of Nagoya and should be examined more in-depth.

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[1] Sprio Kostof, *The City Assembled: The Elements of Urban Form Through History* (Boston: Little, Brown and Company, 1992), 245.
[2] Kostof, *The City Assembled*, 245-246.

Natural and man-made disasters have not only devastated urban areas but have also served as an incentive for dynamic redevelopment.[3] Brassard and Raffin follow this model as they highlight a neglected aspect of disasters, resilience within the affected community.[4] They demonstrate the importance the community can have post-disaster by rallying together to face the unknown. Disasters are continuous and, typically, unexpected, which makes analyzing previous successful methods of reconstruction important. Audefroy has acknowledged, disasters can occur anywhere, and his article considers sensible practices for post-disaster management in Asia and Latin America.[5] From the article's perspective, these two separate, but similar, regions are always ill-prepared for a disaster. Once a city has overcome the annihilation of a disaster, it is critical for the city to be prepared and try to avoid the same devastation. The rise of Japan's modern automotive industry into an imperium is an example of overcoming a disaster. The modern automotive industry developed from an extempore catastrophe, which gave way to a reborn Nagoya. The sparring of the Toyota Motor Company from American Pacific War bombings in nearby Toyota City led to the revitalization of Nagoya after the Pacific War. Nagoya's successful post-Pacific War rebirth serves as an example of surmounting a disaster and rebuild for a fruitful future.

The Pacific War bombing of Nagoya may be compared to the destruction of New Orleans, Louisiana in 2005 by Hurricane Katrina. The cities share several attributes, which are

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[3] The concept of positivity through disaster, natural and man-made, has been examined and detailed by various scholars already. Robert B. Olshansky, Laurie A. Johnson, and Kenneth C. Topping all co-wrote *Rebuilding Communities Following Disaster: Lessons from Kobe and Los Angeles*, which details the importance of post-disaster lessons. Jasper Schenk's article *Historical Disaster Research, State of Research, Concepts, Methods and Case Studies* is another source that dives into the importance of understanding and rebuilding post-disaster. These are a few studies on post-disaster resiliency and recovery, as there are still other disasters and aspects that have been uncharted academically.

[4] Caroline Brassard and Anne Raffin, "Resilience in Post Disaster Societies: From Crisis to Development," *Asian Journal of Social Science* 39, no. 4 (2011): 417-424.

[5] Joel F. Audefroy, "Post-disaster emergency and reconstruction experiences in Asia and Latin America: an assessment," *Development in Practice* 20, no. 6 (2010): 664-677.

key when analyzing different destructive hazards as well as their aftermaths and reconstructions. Both cities have similar average temperatures, with Nagoya in the range of upper fifties and New Orleans in the lower sixties range.[6] These average temperatures result in them being ideal regions for intense flooding and hurricanes/typhoons, depending on the season.[7] Both cities are near prominent waterways, New Orleans being near the mouth of the Mississippi River and Nagoya being near the alluvial plain near Ise Bay. The main parallel is the way in which both destructive incidents left a void in population. For Nagoya, the population went from 1,158,974 in December 1944 to 597,941 in November 1945. It was not until 1950 that Nagoya was able to surpass a population of a million people once again.[8] In the initial years following Hurricane Katrina, New Orleans' population was decimated. In 2006, only 130,000 New Orleans citizens out of the roughly half a million returned to their home city, and the majority of those were displaced university students living in hotels.[9] Both examples of destruction created voids in population along with devastation of their infrastructures and economies.

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[6] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-1-9 Temperature, Temperature, Precipitation, Sunshine Time (2) (Showa 21 to 1987), data visualization by Nagoya City Hall, accessed June 15, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html; "Average Weather in New Orleans, Louisiana, United States," Temperature: Average High a Low Temperature, data visualization by WeatherSpark, accessed June 15 2020, https://weatherspark.com/y/11799/Average-Weather-in-New-Orleans-Louisiana-United-States-Year-Round.

[7] This is a prospective notion as Nagoya has experienced high amounts of flooding from 1986-2006. The annual temperatures fit the necessary temperatures needed for strong flooding or typhoons. In East Asia, there have been 344,782 fatalities from water related deaths – flooding and typhoon storm surge – in the timeframe of 1986-2006, which demonstrates a corresponding rise in disasters in relation with the annual temperatures. With Nagoya positioned near several waterways, it fits right into the prospective idea of water-related fatalities in Aichi Prefecture constantly occurring due to these annual temperatures. Statistical information: Yogonath Adikari and Junichi Yoshitani, "Global Trends in Water-Related Disasters: an insight for policymakers," *The United Nations World Water Assessment Programme*, (2009): 7-11.

[8] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed June 17, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

[9] Robert Rehner Iversen, *Jobs Aren't Enough: Toward a New Economic Mobility for Low-Income Families (*Philadelphia: Temple University Press, 2006), 214.

It took Nagoya five years to miraculously recover its population from the devastation. For New Orleans, the recovery process has been treacherous as the city was on an economic decline before Hurricane Katrina. The average median income was $30,000 and the average neighborhood poverty rate was seventy-four percent.[10] Unlike Nagoya, post-disaster New Orleans continues to struggle in reestablishing its population to the near 500,000 they had pre-Katrina. Thirteen years after the disaster, New Orleans was still at only eighty percent of its pre-flooding population.[11] The stagnation in the New Orleans population indicates that Nagoya's successful reconstruction process is one that needs to be studied and utilized.

Located on the central Japanese island of Honshu the bustling city of Nagoya sits within Aichi Prefecture. Centrally located at the head of Ise Bay, Nagoya lies between Tokyo and Osaka, making it an ideal point when traveling to and from Japan's most populated urban areas. Leading up to the conflicts of the twentieth-century, Nagoya experienced a rapid rise in population, which led to an upsurge in economic production. The substantial population increase coincided with the establishment of companies, such as Toyoda Loom Works, Mitsubishi Heavy Industries, and numerous Aichi Prefecture aircraft companies. This transformed Nagoya and surrounding cities into an economically profitable region for Japan. Nagoya's economy and population declined amid the Pacific War, as America turned to strategic bombing of urban areas. This halted Nagoya's growth, economically and in population, as the city was reduced to rubble from the bombing campaigns. After the Pacific War, the devastation from the American bombings played a vital role in the revitalization of Nagoya's economy as neighboring cities in Aichi Prefecture were largely spared from the bombings. This allowed their economies to

[10] Iversen, *Jobs Aren't Enough*, 216.
[11] Jeff Adelson, "For the 1st time since Hurricane Katrina, census stats show a shrinking New Orleans," *The New Orleans Advocate* (New Orleans, LA), Apr 18, 2019.

flourish, which fed into the reconstruction process. The resurrection of Nagoya became centered on companies such as Toyota Motor Company, which became one of the only industries to work for in the postwar reconstruction years. Centering the reconstruction process around spared companies allowed Nagoya's population to increase as Japanese citizens sought new employment. This second economic miracle brought Nagoya out of the ashes, re-establishing it as prospering Japanese city.

The origins of Nagoya stem from its beginning as a castle town during the Sengoku period under Oda Nobunaga and Tokugawa Ieyasu. Until the Meiji Restoration, Nagoya was little more than a castle town. Nagoya was a key point on the Tokaido since it was central between Kyoto and Edo, which made this an ideal location for samurai. Nearly 22.7%, of the population consisted of samurai as they were limited to castle cities for protection. This is because samurai were not able to own land or farm until the late 1870s-early 1880s.[12] By the 1880s, the caste system had given way to Western modernity where the caste system was abolished, and many castles were demolished in the favor of the new systems. Castles that were not demolished were transformed into parks, monuments, or shrines removing their military purposes and transforming them into tourist sites, such as the Matsumoto Castle or Osaka Castle.[13]

During the late Meiji and early Taisho periods, industries, that focused on using the environment, began to develop across Aichi Prefecture. Initially, forestry, fishery, and agriculture were prominent across the prefecture. Each year the number of workers dwindled as

[12] Marius B. Jansen and Gilbert Rozman, *Japan in Transition from Tokugawa and Meiji* (Princeton, NJ: Princeton University Press, 1986), 342.
[13] Jansen and Rozman, *Japan in Transition from Tokugawa and Meiji*, 343.

the areas of forestation decreased, and the area shifted to a more industrial economy.[14] Mining, construction, and manufacturing increased in the late Taisho period with 125,378 workers on the initial records.[15] Deforestation created a void that was filled by mining, construction, and manufacturing companies. By the turn of the twentieth century, the population had reached 260,748. Only thirteen years later, the population nearly doubled as it reached 447,951.[16] This rapid increase in population might be the catalyst behind the growth of manufacturing industries in the region. New and steady work had to be established to fill the yearly demand from expanding industries. After deforestation, the establishment of newer industries opened prospective opportunities for the citizens of Nagoya.

As Nagoya was experiencing a rise in population, the area became home to two manufacturers. The first was a small loom production company called Toyoda Loom Works. The founder Sakichi Toyoda and his son Kiichiro, established a small company in 1894 selling wooden spinning machines.[17] It was not until 1918 that Sakichi established Toyoda Spinning and Weaving, which had grown to incorporate 1,000 employees. Through the next eight years, the company continued to grow and established Toyoda Loom Works.[18] Weaving became an essential part of Sakichi's early life, as it was an escape for himself and those within his village of Yamaguchi from Japan's constant turmoil. Sakichi was in the midst of questioning reality and the future of his village as Japan was facing two wars within a ten-year span – the Sino-Japanese

[14] Precise figures are difficult to gauge as the numbers begin around the start of the Showa period. These figures are estimates based upon the statistics of the late Taisho period and beyond, and the incline of manufacturing statistics.
[15] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-14 Number of Employees by Industry Major Category (2) (Taisho 9 to 1985), data visualization by Nagoya City Hall, accessed June 20, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.
[16] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed June 17, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.
[17] Eiji Toyoda, *Toyota: Fifty Years in Motion* (Tokyo: Kodansha International, 1985), 11-12.
[18] Toyoda, *Toyota: Fifty Years in Motion*, 13.

War of 1894-95 and the Russo-Japanese War of 1904-5 – and the downfall of the Tokugawa system. Sakichi sought answers to his questions in an astonishing source.

As a man in his twenties, Sakichi read a book titled *Self-Help*.[19] This book inspired Sakichi to take a chance and create a company that eventually became a global industry. The objective of the book described individuals overcoming struggles to enjoy the fruits of life and build upon their success for a stable and prosperous future. This book not only became the blueprint for Sakichi's success but is critical when looking forward into the future. This principle of overcoming struggles to enjoy a prosperous future is an important concept following a disaster. Sakichi applied this principle to better the village of Yamaguchi. Nagoya used this principle post Pacific War, New Orleans applied it post-Katrina, and multiple nations/cities have done the same following a natural or man-made disaster. To achieve a successful future, individuals – solely and collective – must gather and search for self-help. This was the key to a successful future, as Sakichi eventually achieved for his small village of Yamaguchi.

By 1906, Sakichi constructed the Shimazaki Factory in Nagoya. The factory was stellar in that it produced one-hundred fifty power looms per month. The factory took advantage of the two new loom models – Model 39 and Model L – and produced 6,508 yen in sales alone by 1909.[20] By the end of World War I, Sakichi's company had grown exponentially. Sakichi established a stockholders' board, as the company had grown too massive for him to manage alone. Sakichi held forty-eight percent of his company and was president of Toyoda Cotton Spinning and Weaving Co. Ltd, which surmounted three million yen (1.5 million USD) by

[19] Yukiyasu Togo and William Wartman, *Against All Odds: The Story of the Toyota Motor Corporation and the Family That Created It* (New York: St. Martin's Press, 1993), 13.
[20] William Mass and Andrew Robertson, "From Textiles to Automobiles: Mechanical and Organizational Innovation in the Toyoda Enterprises, 1895-1933," *Business and Economic History* 25, no. 2 (1996): 7.

World War I's conclusion.[21] There was no shortage of workers from 1920-1930, as the population had grown over from half a million to around 900,000 in total.[22] Nagoya's population continued to expand, leading Toyoda to flourish nationally, which transitioned globally by the Pacific War. Sakichi's gradual economic and industrial success serves as an example of the system that was utilized on a larger scale with the reconstruction of areas around Nagoya following the Pacific War.

As the Toyoda Loom Works developed, they were not alone, as another manufacturing company was also utilizing the labor force of Nagoya. Mitsubishi Heavy Industries began producing aircraft in Nagoya on the cusp of the Pacific War. Initially, Mitsubishi began as a shipping firm led by Yataro Iwasaki in 1870.[23] By 1884, Nagasaki Shipbuilding Yard became the site for Yataro's company. By 1930, Mitsubishi had produced several branches of industrial companies that ranged from Mitsubishi Electric Manufacturing Company to Mitsubishi Aircraft Company. It was not until 1934 that Mitsubishi Heavy Industries, Ltd. was constructed in Nagoya, which created manufacturing ships, railroad cars, and, predominantly, aircraft for the war.[24] In the 1940s, amid the Pacific War, Mitsubishi produced 12,513 aircraft which constituted seventeen percent of Japanese wartime fleet.[25] As proven, it did not take long for Mitsubishi to take over as a top multi-faceted zaibatsu company.

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[21] William Mass and Andrew Robertson, "From Textiles to Automobiles: Mechanical and Organizational Innovation in the Toyoda Enterprises, 1895-1933," *Business and Economic History* 25, no. 2 (1996): 15.
[22] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed June 20, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.
[23] Mitsubishi Electric Corporation, "History of Mitsubishi Group," Mitsubishi Electric, accessed June 20, 2020, https://www.mitsubishielectric.com/en/about/history/overview/group_history.page.
[24] Mitsubishi Heavy Industries, "As Japan Modernizes, MHI Emerges," About Mitsubishi Heavy Industries, Ltd, accessed June 21, 2020, https://www.mhi.com/company/aboutmhi/outline/history.html.
[25] The United States Strategic Bombing Survey, "The Corporation and Its Importance in the Aircraft Industry," *Mitsubishi Heavy Industries, LTD: Corporation Report* no. 1: (1947), 1.

Unlike Toyoda's simple family-owned loom industry, Yataro's Nagasaki Shipyard and Machinery Works was a zaibatsu, which came at a time when industrializing became prominent in Japan. The zaibatsu economic concept is most simply explained as a monopoly. A more solid definition comes from Kozo Yamamura's article, *Zaibatsu, Prewar and Zaibatsu, Postwar*, which defined it as, "one economist defined Zaibatsu as, a form of monopolistic *konzern*[26], but in that its capital controlled an extremely high percentage of stocks of affiliated firms in many industries and in that its capital effectively extended its influenced into all sectors of the economy… the Japanese Zaibatsu formed a unique type of *konzern*."[27] The zaibatsu allowed Japan to rapidly develop into an industrialized nation during the Meiji and Taisho eras. On the brink of the Pacific War, this allowed many industries to develop and build upon their foundation prior to the war. Having multiple shareholders in a single industry became profitable for industries such as Mitsubishi Heavy Industries as the funds of the shareholders allowed them to grow at a quicker and successful rate. The zaibatsu concept is critical in understanding the foundation of Japan's economy going into the Pacific War, as it was the fuel behind key industries such as Mitsubishi. Industries such as Toyoda Loom Works relied on networking and self-determination to guide their success on the brink of the Pacific War.

While Mitsubishi was not the sole producer of aircraft within the Aichi Prefecture, the company was one of the highest producers, especially after the creation of the A6M Zero fighter plane. Companies such as Nakajima, Aichi, and Kawanishi competed against Mitsubishi for

[26] A konzern is German for 'group.' A konzern is a form of a business group in Europe, specifically in German, where several companies unify under one group, similar to the term monopoly in America. An American version of a konzern (monopoly) is the Walt Disney Company. The Walt Disney Company owns Marvel Studios, ESPN, Lucasfilm, etc., but they all fall under the Walt Disney Company group as they are the primary owner of these subcompanies. The Japanese zaibatsu is the Japanese version of the German konzern, as several Japanese owned companies can fall under the ownership of a single company.
[27] Kozo Yamamura, "Zaibatsu, Prewar and Zaibatsu, Postwar," *The Journal of Asian Studies* 23, no. 4 (1964): 540.

superior Japanese aircraft. In certain cases, Mitsubishi collaborated with other companies and used their parts and equipment in their aircraft. In the A6M Zero fighter, Mitsubishi used Nakajima's engines which changed the way aircraft was constructed in Japan as different and competing aircraft industries integrated components to construct aircraft.[28] Mitsubishi Heavy Industries churned them out in rapid succession. A total of 14,300 A6M Zeroes were produced which is the most of any Japanese aircraft ever produced.[29] While Nagoya was not the sole factory to build them, they were the main site of production, which made them a critical target for the bombing. The A6M Zero became to top fighter plane for the Japanese during the Pacific War, and Mitsubishi Heavy Industries in Nagoya was critical in implementing their success.

The outbreak of the Fifteen Years War changed the economic landscape for Japan, and key cities such as Nagoya felt the brunt of the blow. Once America became involved in 1941, the war shifted away from Japan's favor as America began taking the war to the sea, land, and most destructively, the air. The first air raid against Japanese cities came in April 1942 as the Doolittle Raid dropped incendiaries on various Japanese cities. While there was minor structural damage from the raid across Japan, Tokyo received the bulk of the attack. [30] The raid struck other populated cities such as Nagoya, Kobe, and Osaka, as they were bombed too. The Doolittle Raid was nothing more than to strike revenge for Pearl Harbor and advance American morale upon entry into the war. It was not until the bombings of 1944 and 1945 that Nagoya suffered severe damage from the bombings. The destructive bombings of Nagoya came at the command of General Curtis LeMay. Gen. LeMay took over authority from General Haywood Hansell of the XX and XXI bomber command units as Gen. Hansell produced inadequate results in bombing

[28] Richard J. Samuels, *Rich Nation, Strong Army: National Security and the Technological Transformation of Japan* (Ithaca, NY: Cornell University Press, 1994), 116.
[29] Samuels, *Rich Nation, Strong Army*, 118.
[30] ——— "Enemy's First Air Raid," *Japan Times and Advertiser* (Tokyo, Japan), Apr. 20, 1942.

Japanese cities. One of Gen. Hansell's lone exceptions came against Nagoya when nearly three-quarters of bomb tonnage was dropped on Mitsubishi plants no. 2 and no. 4.[31] The lack of Gen. Hansell's bombing success led to Gen. LeMay switching air raid tactics to a unique style of strategic bombing.

Gen. LeMay wanted to alter the strategic bombing doctrine and the methods previously used by Gen. Hansell. The first major change came at switching bombing attitudes from 30,000 feet to 5,000-10,000 feet. The reasoning behind this was harsh weather often threw the B-29 Superfortress bombers off course and their bombing targets were not accurate because of this.[32] Bombing from 5,000-10,000 also put less strain on the B-29 engines, resulting in burning less fuel and longer bombing missions.[33] Gen. LeMay also decided to do the air raids at night. Flying at low attitudes made the bombing raids incredibly risky, which was the reasoning behind Gen. LeMay wanting to fly at night as it made his bomber commands less receptive to Japanese flak and fighters.[34] The bomber commands also had the advantage of aiming their night time targets at existing flames or using night radar to locate an easy target.[35] Gen. LeMay decided to lighten the B-29 aircraft by removing the guns, ammunition, and gunners. This decision resulted in a removal of around 2,700 pounds, which allowed the B-29 bombers to carry more bomb tonnage.[36] Because of these changes, Gen. LeMay's bomber command units bombed Nagoya more precisely. This strategic bombing yielded more destruction of the city's infrastructure and

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[31] Daniel T. Schwabe, *Burning Japan: Air Force Bombing Strategy Change in the Pacific* (Lincoln, NE: University of Nebraska Press, 2015), 103.
[32] Kenneth P. Werrell, *Blankets of Fire: U.S. Bombers over Japan during World War II* (Washington D.C.: Smithsonian Institution Press, 1996), 152-153.
[33] Werrell, *Blankets of Fire*, 152.
[34] Werrell, *Blankets of Fire*, 154-155.
[35] Schwabe, *Burning Japan*, 117.
[36] Werrell, *Blankets of Fire*, 155.

decreased the population. Without the changes Gen. LeMay implemented to bombing tactics, Nagoya might have sustained minor damage.

Incendiary bombs were devastating to Japanese cities. The 1923 Great Kanto Earthquake had shown the susceptibility of Japanese cities to conflagration. The earthquake killed 140,000 people, torched two cities – Tokyo and Yokohama – and brought tsunamis, floods, and mudslides to the Kanto region.[37] The wooden buildings were constructed to withstand the massive 7.9 earthquake as Japan has always been prone to earthquakes. However, the severe firestorms that followed led to majority of the infrastructure desolation.[38] By the end of the earthquake, ninety percent and sixty percent of the homes in Yokohama and Tokyo were destroyed because of fires.[39] This earthquake became the blueprint for Gen. LeMay's usage of incendiary bombs. The main incendiary weapon used was the M-69 bomb. The M-69 bomb was twenty inches long by three inches wide and held roughly 2.6 pounds of incendiary gel.[40] The bomb was dropped in honeycomb clusters allowing it to disperse around the prospective target. The idea was to incinerate the poorly constructed buildings as the Great Kanto Earthquake had. By dropping tons of M-69 bombs, and intermittently M-47 incendiary bombs, the wide scale damage to Japanese was inevitable.

Gen. LeMay issued the new strategic bombing tactics in March 1945 with *Operation Meetinghouse*. The Japanese cities, Tokyo, Kobe, Osaka, and Nagoya became primary targets for

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[37] Joshua Hammer, *Yokohama Burning: The Deadly 1923 Earthquake and Fire That Helped Forge the Path to World War II* (New York: Free Press, 2006), xiv.
[38] Hammer, *Yokohama Burning*, 87-136.
[39] Kallie Szczepanski, "The Great Kanto Earthquake, 1923," ThoughtCo., published Dec. 1, 2019, https://www.thoughtco.com/the-great-kanto-earthquake-195143.
[40] Stewart Halsey Ross, *Strategic Bombing by the United States in World War II: The Myths and the Facts* (Jefferson, NC: McFarland & Company, Inc., 2003), 108.

American air raids.[41] On March 12, 1945, an American intelligence report on Nagoya described the "congested industrial districts and densely crowded residential sections, with workers' quarters in the vicinity of the industrial districts."[42] Nagoya was heavily bombed and factories such as the Aichi Aircraft Works suffered extreme damage. The Aichi Aircraft Works lost 13.6 percent of its roof area, and the main assembly building was completely decimated.[43] During the final nine months of the Pacific War, Nagoya was bombed from twenty-one raids that dropped 14,054 tons of bombs from American air forces.[44] This sheer tonnage of bombing decimated the city of Nagoya and the infrastructure and economy within Aichi Prefecture.

Toyota's development, as with Mitsubishi, was set back because of the wartime bombings. Mitsubishi became a prominent target for American air raid bombings. One of the first targets during a December 1944 raid was the Mitsubishi Aircraft Engine factory. Two precision raids during the December 1944 air raid attacks led to insurmountable damage to the Mitsubishi factories.[45] The destruction of Mitsubishi continued into 1945, as by April over 2,200 tons of bombs had been dropped on Mitsubishi Aircraft Engine Factory no. 4 alone.[46] The decimation of the Mitsubishi industries in the Nagoya region left a mass quantity of displaced workers postwar. It is possible that nearby Toyota capitalized on the opportunity to use these displaced Mitsubishi workers in their factories producing wartime trucks for America. This is an explanation behind the success of Toyota and the employment within Aichi Prefecture.

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[41] ——— "Number of B-29's Hit Surpasses Production: 278 Downed, Damaged in 4 Raids This Month Against January Output of 162," *Nippon Times* (Tokyo, Japan), Mar. 21, 1945.
[42] Schwabe, *Burning Japan*, 122.
[43] Schwabe, *Burning Japan*, 123.
[44] The United States Bombing Survey, "Summary and Conclusions; Effects of Air Attacks on the City of Nagoya," *The Effects of Air Attacks on the City of Nagoya*, no. 1: (1947), 1-12.
[45] The United States Bombing Survey, "Effects of Air Attacks on the City of Nagoya," *The Effects of Air Attacks on the City of Nagoya*, no. 1: (1947), 8.
[46] The United States Bombing Survey, "Effects of Air Attacks on the City of Nagoya," *The Effects of Air Attacks on the City of Nagoya*, no. 1: (1947), 11.

By the end of the war in August 1945, Nagoya was left in a vicious and broken heap. Nagoya's population declined dramatically from 1,158,974 in 1944 to 597,941 in 1945.[47] The number of citizens killed, injured, and dispossessed totaled 537,452, which is around 44% of the city's pre-raid population.[48] This became one of the facets that set Nagoya back postwar. The other was the layout of the city and the damage to certain areas. Laying the city out in a grid pattern consisting of Northwest, Northeast, Southwest, and Southeast, it is quite noticeable the Northeast section of the city received the bulk of the wartime damage. Industries such as Mitsubishi Electric Manufacturing Co., Nagoya Arsenal factory, Okuma Iron Works, Kobe Steel Works – Nagoya Plant, and the Japanese 6th infantry regiment and 3rd field artillery regiment were all located in the Northeast section of Nagoya, making this portion of town a target for bombings.[49] Key factories, such as Mitsubishi Aircraft Works in the Southeast section, were popular targets as well.[50] These targets in each region made them susceptible to heavy bombing damage.

While all of Nagoya sustained bombing damage, certain areas were unscathed from the heaviest damage of the bombings. Nearly the entire Southwest portion of Nagoya was spared as there were no critical targets in the area for the American air raids.[51] Neighboring cities nearby were completely spared from Pacific War bombings. Toyota City is an example of a neighboring city that remained unscathed after the Pacific War. Toyota City was scheduled to be bombed, but

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[47] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed June 25, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.
[48] The United States Bombing Survey, "Effects of Air Attacks on the City of Nagoya," *The Effects of Air Attacks on the City of Nagoya*, no. 1: (1947), 8-9.
[49] The United States Army Map Service Chief of Engineers, *Nagoya Northeast, Aichi-Ken, Honshu, Japan* [map], Scale: 1:12,500, Washington D.C.: The United States Army, 1946.
[50] The United States Army Map Service Chief of Engineers, *Nagoya Southeast, Aichi-Ken, Honshu, Japan* [map], Scale: 1:12,500, Washington D.C.: The United States Army, 1945.
[51] The United States Army Map Service Chief of Engineers, *Nagoya Southwest, Aichi-Ken, Honshu, Japan* [map], Scale: 1:12,500, Washington D.C.: The United States Army, 1945.

never was, making it pivotal in Nagoya's forthcoming postwar years. These areas and regions became the focal points for the reconstruction process moving forward postwar.

Concentrating on a certain area in the city allowed Nagoya to initiate a reconstruction plan and revive their economy. Recovering post-disaster often depends on the city's economic state before the disaster. Whether the disastrous case was the 1871 Great Chicago Fire, the 1906 San Francisco Earthquake, the 1923 Great Kanto Earthquake, the World War II bombing of Dresden, or Hurricane Katrina in 2006, each disaster case proves that none of these cities was prepared before their respective disaster struck. With the 1871 Great Chicago Fire, there was an outcry from the working-class to rebuild and "fire-proof" the city, that city officials denied.[52] Prior to Hurricane Katrina, there was a plea to strengthen the levees that eventually ended up breaking during the hurricane, leading to mass flooding. All of these disasters can be demonstrated as a positive event in terms of economic and industrial infrastructure revival. Disasters rally city populations together and focus on a prospective way forward. Following the 1906 San Francisco Earthquake, citizens within San Francisco immediately came together to rebuild the city's infrastructure.[53] Reestablishing infrastructure allowed citizens to build the city according to their own visions, which increased morale moving forward in the reconstruction process. When rebuilding postwar Nagoya, the same principle was applied. Citizens and local leaders came together to figure out a method to rebuild the city from their ideal visions. The unison between citizens and leaders was a steppingstone to the benefitting factors from the

[52] Lawrence J. Vale, "Restoring Urban Viability," in *Rebuilding Urban Places After Disaster: Lessons from Hurricane Katrina*, eds. Eugenie L. Birch and Susan M. Wachter (Philadelphia: University of Pennsylvania Press, 2006), 150-151.
[53] Lawrence J. Vale, "Restoring Urban Viability," *in Rebuilding Urban Places After Disaster: Lessons from Hurricane Katrina*, eds. Eugenie L. Birch and Susan M. Wachter (Philadelphia: University of Pennsylvania Press, 2006), 153.

bombings. It was this steppingstone that led to the main beneficial cog of the bombings, which was the transformation of Nagoya's national economy into a global economy.

Japanese officials knew they were in for the long haul in repairing and rebuilding numerous cities. For Nagoya, it was not until 1946 that a reconstruction plan was introduced. The timetable for the plan was thirty-six years, with an end date of September 19, 1982 and the budget was around eighty million yen (744,000 USD).[54] Its main objective were centered on rebuilding the roadways, for travel, and parks, and to improve sanitation and health from the burned-out areas[55]. Two, 100-meter-wide, boulevards were constructed in Nagoya. This allowed travel to flow freely, helping speed up the reconstruction process as national aid and construction crews were able to reach destinations.[56] Large empty spaces were transformed into new roadways or greenways. Housing was a lower priority for recovery. Nagoya ranked third-most with total homes destroyed, behind Tokyo and Osaka, with 125,179 razed homes. Only a mere 6,084 homes, five percent, had been reestablished or rebuild by August 1946.[57] The sheer number of private infrastructures that needed rebuilt was too substantial a task for the Japanese government to do financially, which led to their focus in repairing public sectors. Nagoya's reconstruction plan parallels with that of New Orleans following Hurricane Katrina. The initial plan, developed by the Louisiana Recovery and Rebuilding Conference, included proposals to

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[54] Simon Gunn and Susan C. Townsend, *Automobility and the City in Twentieth-Century Britain and Japan* (London: Bloomsbury Academy, 2019), 53.

[55] Gunn and Townsend, *Automobility and the City in Twentieth-Century Britain and Japan*, 56. Rather than focusing on building infrastructure, governmental officials decided to focus on the health of citizens. Breathing in soot and fumes from the conflagrations was deadly and if not resolved would have been fatal to the citizens that survived or returned to Nagoya. Once the city was cleaned up and health conditions improved, reconstruction on infrastructure became the priority.

[56] Nicholas Fiévé and Paul Waley, *Japanese Capitals in Historical Perspective: Place, Power, and Memory in Kyoto, Edo, and Tokyo* (London: RoutledgeCurzon, 2003), 313-316.

[57] ——— "Poor Progress Made in Building Houses: Only 271,900 Are Constructed Throughout Country Up To End of July," *Nippon Times* (Tokyo, Japan), Aug. 16, 1946.

reestablish light rails, playgrounds, parks, and select neighborhoods.[58] The trend is to rebuild the foundations of the city, i.e. roads, parks, small neighborhoods, then progress toward the infrastructure and industrial sectors.

One crucial benefit in Nagoya's reconstruction process was the nearby town of Toyota, which escaped the Allied destruction. After World War II, Toyota Motor consolidated all of its research efforts into Toyota Research and Development Laboratories in Nagoya.[59] This allowed the company to focus on developing its automotive industry. Toyota's automotive industry began in the mid-1930s in Koromo-cho, manufacturing trucks for the army's use.[60] Once the war ended, this became Toyota's primary focus. In 1950, Toyota expanded exponentially as the Korean War broke out. America sought cheap, indispensable army trucks and went to Toyota for the vehicles. Toyota's sales rose by forty percent, which was described as "Toyota's salvation" by the company president.[61] Toyota's rise in profits were not alone as Japan's steel industry rose by thirty-eight percent because of the demand for automotive production.[62] The Korean War and the economic rejuvenation that came with it became known as the "Second Miracle or Japanese Economic Miracle." From 1950-1953, the length of the Korean War, Japan brought in 2.3 million yen in revenue.[63] This rapid increase in revenue brought a swift escalation in the reconstruction process to all of Japan.

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[58] R.W. Kates, C.E. Colten, S. Laska, and S.P. Leatherman, "Reconstruction of New Orleans after Hurricane Katrina: A research perspective," *Cityscape* 9, no. 3 (2007): 12.
[59] Yasuo Miyakawa, "Nagoya: The Core of Japan's Global Manufacturing Industries," in *Japanese Cities in the World Economy*, eds. Kuniko Fujita and Richard Child Hill (Philadelphia: Temple University Press, 1993), 165.
[60] Yasuo Miyakawa, "Nagoya: The Core of Japan's Global Manufacturing Industries," in *Japanese Cities in the World Economy*, eds. Kuniko Fujita and Richard Child Hill (Philadelphia: Temple University Press, 1993), 165.
[61] John W. Dower, *Embracing Defeat: Japan in the Wake of World War II* (New York: W.W. Norton & Company, Inc., 1999), 542-43.
[62] Dower, *Embracing Defeat*, 542.
[63] Dower, *Embracing Defeat*, 542.

An outcome from the second economic miracle was a rise in employment. During the Pacific War, employment was outweighed by unemployment 952,390 to 1,045,300. By the outbreak of the Korean War, a mere five to seven years later, employment almost equaled unemployment by 1,006,007 to 1,073,310.[64] Increased population accompanied this rising demand for labor. By 1950, the population surpassed one million again.[65] Nearby Toyota City benefitted from the rise in employment, population increase, and the mass production of wartime trucks for America. In 1953, Toyota produced a record number of 3,572 cars and 12,422 trucks.[66] Toyota Motor brought recovery to Nagoya's economy and as a result opened new opportunities for employment. This is a prime case of an industry benefitting from a disaster.

Whether the 1906 San Francisco Earthquake, the 1923 Great Kanto Earthquake, the World War II bombings of Dresden, or Hurricane Katrina in 2006, the destruction to cities is unpredictable. Nagoya's citizens and leaders were not fully ready for sheer destruction from American air raids, but quickly rallied together to rebuild their city's foundation. The bombings were destructive to the area but allowed Nagoya to establish a modern economy through the automotive industry. This modern economy establishment saved Nagoya within ten years, as their population, morale, infrastructure, and economy were better than prewar statistics. The same recovery process was applied to New Orleans post-Katrina to have a stronger city post-disaster within ten years. It is inevitable that this same reconstruction model will be applied in

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[64] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-12 Employed/Unemployed Population (Taisho 9 to 1985), data visualization by Nagoya City Hall, accessed June 30, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.
[65] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed June 30, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.
[66] Togo and Wartman, *Against All Odds*, 129.

the future following a disaster, as Nagoya and New Orleans was not the first or the last to use it and can be improved upon moving forward.

Chapter One:

The Transformation of Textiles to War Planes:
Aichi Prefecture's Early Development and the Impact on Nagoya, 1868-1931

At the start of the Meiji Restoration in 1868, Aichi Prefecture's commerce consisted of light industries focused on producing pottery and textiles. These light industries initially began producing more pottery than textiles in the prefecture, especially in the city of Seto. By the 1870s, Seto produced pottery at a rapid rate with an increase of kilns to 305, which opened the door for distribution in nearby Nagoya.[67] Pottery produced from local towns and distributed throughout Nagoya became the primary supplier of capital during the late Meiji Period and into the Taisho Period. At the turn of the twentieth century, industries shifted from pottery production to textile production with Toyoda Loom Works leading the way.

While Aichi did have other textile companies in the region, Toyoda Loom Works accounted for over ninety percent of loom and textile production in the 1910s-1920s.[68] As the Showa Period started, Japan was on the cusp of warfare with China. Light industries gave way to heavy industries to generate wartime supplies, such as military aircraft under Mitsubishi Heavy Industries in Nagoya. With the production of heavy industries came a precipitous rise in population within Nagoya in the 1920s-1930s. The transformation from light industries to heavy industries within Nagoya city limits during the late Taisho/early Showa periods made Nagoya a prominent target for Allied bombing during the Pacific War.

Nagoya had a relatively small population during the Meiji Restoration. By 1889, Nagoya had hardly eclipsed 157,000, which is a minor figure compared to where the city's population was heading by the turn of the century.[69] It was not ideal for heavy manufacturing companies to

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[67] Yasuo Mishima, "The Industrial Revolution in Pottery in Japan—Seto and Nagoya," *Kyoto University Economic Review* 25, no. 2 (1995): 33.
[68] William Mass and Andrew Robertson, "From Textiles to Automobiles: Mechanical and Organizational Innovation in the Toyoda Enterprises, 1895-1933," *Business and Economic History* 25, no. 2 (1996): 11.
[69] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed September 5, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

establish roots in Aichi Prefecture because of the small number in population. Light industries dominated in the late nineteenth century, and the population remained in close clusters. In 1889, Nagoya had slightly over 48,000 household residents out of the 157,000-total population.[70] These households were centered in two areas of the city, primarily, on the Hori River on the eastern bank and the Nagoya Castle in the northern part of the city. Below, in southern Nagoya population was scarce near the ports of Ise Bay as it served little purpose for citizens to reside there. The population gradually spread out moving from south to north. The densest portions of the city centered on the intersection of the castle and river.[71] For light industries to survive in Nagoya, it was crucial to be near the Hori River or a highly traveled area such as the Nagoya Castle.

The location of the residences led to shipping ports, which were vital for small family-owned businesses. Selling textile products was twofold in order to be successful, selling to locals or travelers in town where there was high-foot traffic and shipping products outside of the prefecture to lofty commerce cities. As this way of life became fruitful for those living in Aichi, the population began to grow exponentially. Often the Meiji Restoration is labeled, "the economic miracle of Japan" or "the first economic miracle of Japan," and Aichi Prefecture is solid proof of that statement. The transformation from light industry into heavy industry began during the Meiji Restoration as the economy, population, production, and Nagoya's success as a distributor all exceeded expectations.

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[70] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed September 5, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

[71] Network2010, *The Full Picture of Nagoya in the 20th Year of the Meiji Era* [map], Scale unknown, "Nagoya Area of the Meiji Era," accessed September 5, 2020, http://network2010.org/meijimap.

Seto provided a path for Nagoya to develop into a pivotal, industrially-sound city going into the Taisho and Early Showa Periods. While Seto pottery's value fell because of mass production and capitalization at the hands of wholesalers, it established a blueprint for Nagoya's economy and commerce moving forward and provided insight into a successful business strategy for incoming companies. Light industries in Aichi began with pottery and ceramics production. No Japanese city truly equaled the pottery Seto produced. Located around twenty-five kilometers from Nagoya, Seto pottery began as early as the thirteenth century. It was not until the early Edo Period when porcelain production became widespread in the area. In 1672, Seto had forty-five families living within the village. Twenty of them operated potteries and shared the twelve kilns in the village. This high production led to pottery being a focal point of the village's commerce.[72] While pottery was prominent, it took a drastic decline in value until the Meiji Restoration began, and the government reopened trade again.

Seto had grown from the forty-five-home village in 1672 to nearly 300 homes by the start of the Meiji Restoration. The first few decades of Meiji consisted of a pottery recession caused by an excess of production. From 1878-1883, Seto experienced an inflation in pottery. At the start of those six years, a Seto ceramic piece sold for 7.7 sen but by the end of that span had decreased to a mere 2.9 sen. By 1883, pottery accounted for nineteen percent of Seto's commerce, which was second behind the fifty percent farming produced.[73] To compensate for the dwindling revenue, Seto potters enforced new regulations in order to improve their finalized pieces and crawl out of the recession. Constructing ceramics under these six attributions led to

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[72] Yoshie Itani, "Export Porcelain from Seto in the Meiji Era," (PhD diss., University of Oxford, 2006), 11.
[73] Yasuo Mishima, "The Industrial Revolution in Pottery in Japan—Seto and Nagoya," *Kyoto University Economic Review* 25, no. 2 (1995): 33. Japanese sen were similar to American pennies in value. A total of 100 American pennies is equivalent to a full USD dollar. The same is applied for sen. A total of 100 sen is equivalent to 1 yen. Sen came as a two-cent coin, which means the value of sen is one-fiftieth of a one yen. The two-cent coin was only around from 1873 to 1884.

Japan's first union, the Seto Ceramic Union.[74] The establishment of the union paved the way for Nagoya to grow into a capitalistic giant.

After the creation of Seto Ceramic Union, Nagoya became the prominent distribution hub for local renowned pottery and ceramic products. To fast-track production, potters often sold half-finished products to Nagoya wholesalers who had the pieces go through a twofold process. The first phase consisted of finishing them with pattern-paintings at the private residences of pottery experts contracted through the Nagoya wholesalers. There were four primary experts used during the process of pattern-painting who were all contracted through the wholesalers from March 1883 to April 1893.[75] Once the experts finished the pattern-painting phase, they initiated the second phase of the process. The second phase consisted of sending the pieces through Nishiki-gama (finishing kilns) and preparing them for distribution. Nagoya benefitted economically from the half-finished products but also from Seto requiring access to Nagoya's ports to ship the fully finished products.

While Seto needed Nagoya's resources, wholesalers, distributors, and waterway access, in order to flourish in the latter nineteenth century, it also led to the city's downfall as the primary industry in Aichi. In the 1890s and early 1900s, porcelain products from Seto started to give way to wholesalers establishing manufacturing plants in Nagoya for mass production and international distribution. At this time, Nagoya's population started to expand rapidly. From 1890 to 1900, the population increased from 164,849 to 260,748, nearly 10,000 per year in that

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[74] Yoshie Itani, "Export Porcelain from Seto in the Meiji Era," 19.

[75] Yasuo Mishima, "The Industrial Revolution in Pottery in Japan—Seto and Nagoya," *Kyoto University Economic Review* 25, no. 2 (1995): 34. These four wholesalers companies were: 陶器釉ステーション (Pottery Glazing Station), 松村磁器工場 (Matsumura Porcelain Manufactory), トキフジグレージングステーション (Tokifuji Glazing Station), and 陶器工場 (Pottery Manufactory).

timeframe.[76] In those ten years, the majority of the population was aged 0-24, which provided a vital resource for upcoming or recently established young labor for manufacturing.[77] The rise in young labor became key when Nagoya constructed a manufacturing plant for pottery.

Nippon Pottery was established in January 1904 in the Nishi Ward of Nagoya.[78] It employed 510 workers to get the factory functioning at an efficient rate, but once it succeeded it demonstrated the significance Nagoya could, and eventually would, have in heavy manufacturing.[79] Light industries still ruled in the economic sphere, but Nippon Pottery was a glimpse of what was coming. Between the young population providing labor, the hasty expansion of Nagoya's city limits, and the early success of manufacturing, Seto pottery declined to near extinction. Aside from a few exceptions, potters became financially dependent and controlled by the Nagoya large-scale manufactures and, inevitably, fell victim to them. These wholesalers ended pottery's reign as the foremost light industry in Aichi and opened the way to textiles production to surpass as the prefecture's top light industry.

While Seto pottery declined in the 1890s, Nagoya's city limits were rapidly expanding eastward. By 1910, Nagoya had more than doubled in population and geographic size. The population skyrocketed from 164,849 in 1890 to 405,646 in 1910.[80] Significant reasons behind the increase in population were the escalation of the number of people calling Nagoya home

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[76] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed September 6, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.
[77] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-8 Age 5 years old Population by class (1) Meiji 32 to 1988), data visualization by Nagoya City Hall, accessed September 6, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.
[78] Nippon Pottery was 日本時後明会社(Nihon Toki Gomei Kaisha)
[79] Yasuo Mishima, "The Industrial Revolution in Pottery in Japan—Seto and Nagoya," *Kyoto University Economic Review* 25, no. 2 (1995): 48. The workers were divided by 431 men and 79 women.
[80] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed September 6, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

because of an increase in city limits. From 1890 to 1910 immigrants who contributed to Nagoya's population went from 40,002 to 192,045.[81] This growth was a remarkable feat for Nagoya, considering the country as a whole experienced two separate wars in the period. Wars can often diminish the population, especially two within ten years, so to have Nagoya climb in population validates the city as an economically sound place during the late Meiji Restoration.

The annual increase in Nagoya's population from 1890 to 1910 led to an industrial development causing city-wide expansion. While in 1890, the city consisted of growing shipping ports, light industry, and developing infrastructure crowded around the Hori River and Nagoya Castle, by 1910 Nagoya had grown to the point of expanding eastward. The notion of centering on waterways and high-traffic areas died out. The notion had become to find any available spot within the city in order to exploit the benefits of the rising commerce. Nagoya had been transformed from a meager shipping town to a metropolis based on commercial production. By 1910, this evolution led to Nagoya not simply expanding eastward, but also establishing greeneries, rail systems, and wards that continuously grew in the eastern section of the city.[82] Nagoya was blossoming into a major city, and Toyoda Loom Works was ready to seize on the economic opportunity.

Before establishing Toyoda Loom Works, Sakichi Toyoda constantly focused on improving loom production methods. From his perspective, time was money, but it was equally

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[81] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-23 Number of arrivals and departures (Meiji 22 to Showa 3), data visualization by Nagoya City Hall, accessed September 6, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

[82] Network2010, *The Full Picture of Nagoya in the 20th Year of the Meiji Era* [map], Scale unknown, "Nagoya Area of the Meiji Era," accessed September 5, 2020, http://network2010.org/meijimap and Network2010, *Nagoya Entire Figure in Meiji 43* [map], Scale unknown, "Nagoya Area of the Meiji Era," accessed September 5, 2020, http://network2010.org/meijimap.

important to produce quality loom machines for buyers. While getting the business started Toyoda was driven by an aspiring thought:

> In those days, spinning and weaving was not a thriving business as it is today (mid-1880s). The work was done by old women sitting at home and weaving the cloth by hand. Although everybody in my village was a farmer, every house also had its own handloom. I began thinking about ways to power the looms so that weaving could be done faster, and more cloth could be made more cheaply. People could then buy cotton goods for less, and that would benefit society substantially.[83]

He spent the next ten years dedicated to research of loom works. By 1895, Toyoda Shoten in Nagoya opened, his first loom works company.[84] Four years later, in 1899, Sakichi experienced a dream come true. Representatives from Mitsui, a massive trading company in Japan at the time, reached out to him because of his impressive accomplishments. Mitsui was impressed by his quick production and saw an opportunity to export loom production machines to China. Mitsui's proposal included exclusive rights for them to sell his loom machines. They would finance the production facilities, and he would be chief engineer and would oversee management and the logistics of the company, which became Igeta Shokai. This agreement allowed him freedom to focus on research and improve the quality of his product. He accepted the proposal with little hesitation as a lifelong dream had become reality.[85]

After a few problematic years between Sakichi and Mitsui, the company Igeta Shokai dissolved and became Toyoda Loom Works, which started producing and selling loom mills. The problems between the two arose from the Boxer Rebellion. The company was selling loom

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[83] Toyota Motor Corporation, *Toyota A History of the First 50 years* (Toyota City, Aichi Prefecture, Japan: Dai Nippon Printing Co., Ltd., 1988), 25.
[84] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 27.
[85] Yukiyasu Togo and William Wartman, *Against All Odds: The Story of the Toyota Motor Corporation and the Family That Created It* (New York: St Martin's Press, 1993), 20 and Toyota Motor Corporation, *Toyota A History of the First 50 years*, 28.

works to China, but the xenophobic rebellion halted imports on international industrial goods.[86] The new company commenced production at an unfortunate time. Japan fell into a hard recession caused by the Russo-Japanese War in 1904-1905. By 1907, Toyoda Loom Works was on the brink of collapse due to the recession. Loom works across Japan felt the drops of the post-Russo-Japanese War recession. Seeking to salvage the business, the loom works' board cut Sakichi's research budget. This management of finances led to back and forth bickering until 1910 when he reached a breaking point and resigned. By resigning, he lost rights to his machines—even though the company continued to use the Toyoda name and the production factory after his resignation.[87] Distraught by his loss and back to the beginning, he never lost sight of hope. It was his dream to produce looms in mass production for a low price to buyers, and he continued to seek that dream despite the setbacks.

Sakichi did not have to wait long for a fruitful outcome on his textile ambition. On a trip abroad to England and America, he observed six different American loom patents.[88] While analyzing these American inventions, he felt his techniques and engineering were vastly superior to his overseas observations. He returned home and established a new company, called Toyoda Automatic Weaving Factory.[89] He opened the new factory in Nagoya and had early success as from 1911 to 1914 production increased from 100 to 200 looms.[90] Sakichi was surging in textile commerce as he had in the previous decade. By the early 1910s, his upsurge led to 216 factories using his looms across Japan, with thirty factories having anywhere from fifty-one to around 200

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[86] Mitsui & Co., "Sakichi Toyoda and Toyota Industries Corporation backed by the former Mitsui & Co.," Mitsui & Co, accessed October 22, 2020, https://www.mitsui.com/jp/en/roots/1209872_7253.html.
[87] Togo and Wartman, *Against All Odds*, 23.
[88] William Mass and Andrew Robertson, "From Textiles to Automobiles: Mechanical and Organizational Innovation in the Toyoda Enterprises, 1895-1933," *Business and Economic History* 25, no. 2 (1996): 12.
[89] **豊田地堂紡織工房** (Toyota Automatic Weaving Factory).
[90] William Mass and Andrew Robertson, "From Textiles to Automobiles: Mechanical and Organizational Innovation in the Toyoda Enterprises, 1895-1933," *Business and Economic History* 25, no. 2 (1996): 13.

looms.[91] At this time, two feats were occurring domestically and internationally relative to Nagoya. Domestically, it had grown to become one of Japan's largest cities in population density as the population had grown to 447,951 by 1913.[92] Internationally, World War I ignited an economic surge in Japan's economy and, in particular, Nagoya's textile industry.

Because textile companies located production facilities in Nagoya, the city continued to develop. Nagoya's growth came as early as 1900 with the city's southwest section and northeast section increasing at a swift pace.[93] The causation for growth in Nagoya's southwest section stems from its access to shipping ports in Ise Bay. Companies, such as Sakichi's, tried to position themselves in this section of the city for easier domestic or international distribution. Development in northeast Nagoya led to multiple railways being established that ran either through or near the densely populated communities. These highly populated areas depended on the rail system in the northeast while the southwest depended on the waterways for transportation and exports. From the outset of World War I, these transportation methods became vital for distribution of increased textile production. Sakichi's loom factory experienced an economic boom that led to the company becoming Toyoda Spinning and Weaving Company, Ltd, in January 1918.[94] His company grew to a value of five million yen and expanded to 34,000 spindles, 1,000 looms, and 1,000 employees.[95] It became clear that after many trials and tribulations he had established a successful company.

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[91] Takeo Izumi, "The Cotton Industry," *The Developing Economies* 17, no. 4 (1979): 405.
[92] Wesley Coulter, "A Dot Map of the Distribution of Population in Japan," *Geographical Review* 16, no. 2 (1926): 1-3.
[93] 今枝新三郎 製圖 (Imaeda Shinsaburo), 名古屋熱田實測圖 愛知縣廳測量 (Nagoya Actual Survey Map Aichi Prefectural Office Survey [map], Scale unknown, 名古屋 (Nagoya): 若山文二郎 (Bunjiro Wakayama), 1900.
[94] Similar to 豊田地堂紡織工房 (Toyota Automatic Weaving Factory), but also known as Toyoda Jido Boshoku Kojo. This was a revised version of the previous company.
[95] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 32.

By 1918, Nagoya had four separate major railways that ran through the city. Additionally, there were smaller tramway systems, such as the Seto to Nagoya tramway line, that carried passengers from regional towns to Nagoya.[96] Light industry needed railways and waterways in order to survive. During the era, pottery had developed into a major industry for Japan. However, porcelain was not the lone profitable industry in Japan as cotton textile sales were at an all-time high. In 1918, 1006 million square yards of cotton products were exported from Japan.[97] Light industries, such as Toyoda Spinning and Weaving, continued to grow alongside Nagoya's population and city-wide evolution. While light industries were on track to shape Nagoya's future economically and establish the city as one of Japan's prominent textile hubs, the Mitsubishi zaibatsu was seeking opportunities in Nagoya as well.

The early twentieth century saw Mitsubishi's growth into a zaibatsu. By the time the founder's son, Iwasaki Hisaya, took over the company in 1893, they had successfully christened the first Japanese-built oceangoing steamship, the *Hitachi-maru*.[98] As World War I had brought valuable profits to Toyoda, Mitsubishi had cashed in on the same wartime opportunities as international trade led to a high demand for ships. Sales reached an all-time high in 1914 with 13,367 ships being produced.[99] After World War I, the steamship company set its sights on expanding globally. Between 1915 to 1920, eighteen production facilities across the globe were opened, with one of those being in Nagoya.[100] The company saw the promise that Nagoya

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[96] Government of Japan, *General Railway Map of Japan & Manchuria* [map], Scale: 1: 1,300,000, Tokyo: Department of Railways, Government of Japan, and Tokyo Tsukiji Foundry, 1917.
[97] Gary Saxonhouse, "Mechanisms for Technology Transfer in Japanese Economic History," *Managerial and Decision Economics* 12, no. 2: (1991), 88.
[98] Mark Weston, *Giants of Japan: The Lives of Japan's Greatest Men and Women* (New York: Kodansha America, Inc., 1999), 18.
[99] **三菱重工業** (Mitsubishi Heavy Industries), **三菱重工業株式会礼**史 (History of Mitsubishi Heavy Industries Stock Company) (東京, 來京®千代丸 [Tokyo, Kikyo Chiyomaru]: 三菱重工業株式会礼 [Mitsubishi Heavy Industries Stock Association], 1956), 194.
[100] Weston, *Giants of Japan*, 19.

offered and, as a growing zaibatsu, sought locations with expanding populations for labor. This criterion was realized in Nagoya, as the majority of the population was from 15-34, the prime age for manufacturing labor.[101]

Mitsubishi selected a pristine location for their Nagoya aircraft plant. Located in southeast Nagoya, right off the Ise Bay and convenient for shipping, the heavy industries plant was built in 1920. In geographical association, Toyoda's loom plant was in the northwest section, less than three kilometers west of Nagoya Castle.[102] The company wasted little time configuring a top tier aircraft, as the following year plans were in motion to design the first carrier-borne aircraft.[103] Before World War I, aircraft were constructed primarily out of wood and metal framing, which often led to disastrous results. By the early 1920s, Dr. Aikitsu Tanakadate, Japan's leading aeronautic authority, saw the hazards in flying planes constructed from mostly wood. Because wooden aircraft were susceptible to fire, easy to shoot down during war, and clunky to maneuver, Dr. Tanakadate advocated for an all-metal aircraft. This development led to a race among three aircraft companies to produce an all-metal plane: Aichi, Nakajima, and Mitsubishi. Nakajima was already ahead in the race with the creation of parallel copy of the British Gampet carrier-borne fighter.[104] Mitsubishi had hardly constructed a plant by the time the race began, and Aichi Aircraft Co. was transitioning from a watch and electric

[101] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-8 Age 5 years old Population by class (1) Meiji 32 to 1988), data visualization by Nagoya City Hall, accessed September 6, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.
[102] Toyota Commemorative Museum of Industry and Technology, "The Purpose of Establishment," accessed October 22, 2020, https://www.tcmit.org/english/outline/. The commemorative museum is in the location of the original Toyoda factory that Sakichi opened in 1911. It is still open today for visitors to take in Toyoda's history.
[103] Akira Yoshimura, *Zero Fighter* (Westport, CT: Praeger Publishers, 1996), 7.
[104] Yoshimura, *Zero Fighter*, 8-9.

company—Aichi Tokei—into an aircraft company in 1920.[105] To prepare for the competition, Nagoya's Mitsubishi plant searched for a chief engineer.

Mitsubishi Aircraft selected Dr. Jiro Horikoshi as the chief engineer. Horikoshi was in his mid-twenties when appointed and had recently graduated from the Department of Aeronautics in the School of Engineering at Tokyo Imperial University.[106] Japan's navy and aeronautical department had three main requirements for the challenging companies: the aircraft had to have 1) a maximum climb speed of 325-375 km/hour, 2) a climb rate of 3,000 meters within four minutes, and 3) a wingspan smaller than 10.3 meters.[107] To gain a better understanding of metal aircraft designs, Horikoshi traveled to America, England, France, and Germany to study aircraft designs.[108] This research led to his first aircraft design, the 1MF10. The flaw with the aircraft was it was not fully metal and the wings were covered in dense fabric making the flight unstable. When tested against the Nakajima plane, maneuverability favored Nakajima, but speed favored Mitsubishi. As tensions between China and Japan were building, it became evident that a second Sino-Japanese War was on the horizon. This crisis led to a shakeup in the competition with the craft design being switched from a carrier-borne plane to a single-seat fighter for wartime use.

It became Horikoshi's sole objective to win the competition and create a top-notch single-seat fighter for Japan. The requirements went from threefold to fivefold for the updated competition: 1) maximum speed of more than 350 kilometers per hour at 3,000 meters, 2) climbing rate of less than six minutes thirty seconds to 5,000 meters, 3) more than 2,00 liters of

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[105] Robert C. Mikesh and Abe Shorzoe, Japanese Aircraft, 1910-1941 (London: Putnam Aeronautical, 1990), 61. The company was (愛知時計電機) Aichi Tokei Denki Seizo Kabushiki Kaisha.
[106] Masatake Okumiya and Jiro Horikoshi, *Zero!: The Air War in the Pacific During World War II From the Japanese Viewpoint* (Washington D.C.: Zenger Publishing Co., Inc, 1956), 17.
[107] Yoshimura, *Zero Fighter*, 12.
[108] James D'Angina, *Mitsubishi A6M Zero* (Oxford, UK: Ospery Publishing, 2016), 7.

fuel capacity for range, 4) two sets of 7.7-millimeter fixed machine guns and a radio receiver only, and 5) a size less than eleven meters in width by less than eight meters in length.[109] By 1938, Horikoshi had created a fighter plane that exceeded all expectations. Code named 12Si or "Zero Fighter" the A6M1 design was submitted to the Japanese navy and aeronautical department. Mirroring the American Chance-Vought V-143 aircraft in landing gear, craft dimensions, and maneuverability, the Zero Fighter met those criteria and added speed to make it a lethal aircraft. The Zero fighter was constructed around an under-powered engine, light-weight framing, and Hamilton Standard speed propellers.[110] Eleven months passed after the initial submission of the 12Si proposal to the Japanese navy and aeronautical departments. In those eleven months, Horikoshi and a group of engineers spent countless hours perfecting and tinkering with the design until its completion in March 1939.[111] Horikoshi's passionate work was accepted and ready for mass production in Nagoya by Mitsubishi Heavy Industries.

By the time the Zero fighter was ready for mass production, Nagoya's population had eclipsed one million. When the Zero fighter began mass production, the population in 1939 had grown to 1,249,100, with the majority still being between the ages of 15-24.[112] This labor supply led Mitsubishi to keep their aircraft factory in Nagoya. The city had expanded from its narrow strip of land consisting of tightly bunched cloistered sections near waterways and high-volume

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[109] Yoshimura, *Zero Fighter*, 14.
[110] Gary Boyd, "The Vought V-143 1930s Technology Transfer," *Air Power History* 43, no. 4 (1996): 33. The company was also known as (住友金属株式会社) Sumitomo Metal Company.
[111] Yoshimura, *Zero Fighter*, 52.
[112] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Cumulative comparison of population (Meiji 22 to Showa 64), data visualization by Nagoya City Hall, accessed September 7, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html and "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-8 Age 5 years old Population by class (1) Meiji 32 to 1988), data visualization by Nagoya City Hall, accessed September 7, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

areas in the 1890s to a prospering city in 1930 that expanded in every direction.[113] Mitsubishi continued to function near Ise Bay. This location allowed the company to easily receive imports, as well as send out exports, and for test flights in a relatively open area away from the city. The location of the plant became strategic as they continued to spread their roots in Nagoya with various subsidiary companies in electronics, steel and chemicals.

Establishing roots in Nagoya was the strategy throughout the 1920s and 1930s for Mitsubishi. The population rose to a peak of 1.3 million by the end of the 1930s, which was ideal for mass production.[114] The location near a port with high traffic contributed to high sales. [115] Once the company became a conglomerate and expanded Mitsubishi Aircraft Company into the city, the number of employees grew from 12,451 in 1933 to 23,752 in 1934.[116] Swooping in to fill this void was the surging population of Nagoya in the 1930s. By this time, Japan was, again, at war with China and needed high-volume production of the A6M1 fighter planes.

All while Mitsubishi was expanding their zaibatsu economic empire in Nagoya, Toyoda Spinning and Weaving had a change in reigns from Sakichi to his son Kiichiro. With the change in leadership came a shift in the direction of the company. Kiichiro Toyoda had attended college and majored in mechanical engineering at Tokyo Imperial University. In the 1920s shipbuilding was prominent in engineering courses, but there was a growing interest in researching

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[113] Toshihide Matsuoka, *Nagoya, Aichi Prefecture, Honshu (cartographic material)* [map], Scale: 1:20,000, Japan, 1930 and Network2010, *Nagoya Entire Figure (Early Showa Period)* [map], Scale unknown, "Nagoya Land Figure of the Early Showa Period," accessed September 7, 2020, http://network2010.org/showamap.

[114] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed September 7, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

[115] Network2010, *Nagoya in the 8th year of the Showa Era* [map], Scale unknown, "Nagoya in the early Showa era 'Mitsubishi Heavy Industries Nagoya Aircraft Manufacturing Co., Ltd," accessed September 7, 2020, http://network2010.org/article/152.

[116] **三菱重工業** (Mitsubishi Heavy Industries), **三菱重工業株式会礼**史 (History of Mitsubishi Heavy Industries Stock Company) (東京, 來京千代丸 [Tokyo, Kikyo Chiyomaru]: 三菱重工業株式会礼 [Mitsubishi Heavy Industries Stock Association], 1956), 195.

combustion engines.[117] The interest for him originated from his days as a university student taking in courses dedicated to combustion engines. During the late 1920s, he went on a business trip to America and England, similar to his father's trip a decade before. While in America, he witnessed mass production of American automobiles. Ford Motor Company was profiting from the mass production of Model T automobiles. American companies contributed to the over five-million vehicles mass-produced in the late 1920s.[118] Once he returned to Nagoya, he shifted his research from textile production to automotive production.

Automobiles in 1920s Japan were a rare sight. Only 13,000 were registered in all of Japan in 1923.[119] Still, Kiichiro had inherited determination from his father and wanted to explore the automotive realm. He took on the task of finishing and perfecting his father's looms before diving into the automotive industry. By 1924, he had a successful loom product which sold for 630 yen. Toyoda's looms were more expensive than the average loom—which cost 200 yen—but with Toyoda's loom, a single worker was able to oversee the production of twenty-five looms simultaneously.[120] Once he found a way to sell Toyoda's loom in mass quantities internationally, he began his quest to find a way to join the automotive industry.

Kiichiro started with building automotive engines. He knew this element was the heart and soul of every vehicle after visiting foreign assembly plants and wanted to find a way to expand and improve combustion engines. He employed his cousin Eiji Toyoda to help him analyze various engines and their characteristics.[121] Eiji became an understudy to Kiichiro throughout the entire automotive process. He dedicated a section of the Toyoda Loom Works

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[117] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 38.
[118] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 39.
[119] Togo and Wartman, *Against All Odds*, 32.
[120] Togo and Wartman, *Against All Odds*, 34.
[121] Weston, *Giants of Japan*, 59.

factory to automotive research. He knew he needed to introduce American production techniques before trying to perfect anything related to automobiles. He decided to introduce this method in the loom business to see the direction it took. He also ordered foreign tools from America and Germany to help laborers become acquainted with them.[122] While building his loom factory into an automotive factory, Kiichiro realized that to be successful in the automotive business he needed to produce a cheaper vehicle than foreign models. He decided to produce a 3,000-cc passenger car that had high demand.[123] To further this notion, Kiichiro stated,

> Instead of avoiding competition with Ford and Chevrolet, we will develop and mass-produce a car that incorporates the strong points of both and that can rival foreign cars in performance and price. Although we will base our method of production on the American mass production system, it will not be an exact imitation but will reflect the particular conditions in Japan.[124]

To spearhead the idea of producing vehicles, he went to his brother-in-law, Risaburo Toyoda, who helped manage Toyoda Spinning and Weaving. The two agreed that with the loom business being highly lucrative, the time was right to embark into the automotive business. In 1933, Toyoda added an automotive department, which took over half of the loom works plant.

To supplement the newly created automotive department, stockholders in Toyoda voted to increase capital by three million yen. This funding led to the construction of a pilot plant and a steel mill within the Toyoda Loom Works limits.[125] In 1934, the first prototype engine had been completed. While the engine was quite weak, it led to Kiichiro developing a different approach in the automotive business. He came up with the idea of producing trucks instead of cars. The

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[122] Togo and Wartman, *Against All Odds*, 38-39.
[123] C.C. stands for cubic centimeters. The vehicles in high demand were the equivalent to a four-door passenger car or smaller SUV.
[124] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 45.
[125] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 47.

following year, Kiichiro, his understudy Eiji, and his team of engineers had completed the G1 prototype truck. When the G1 truck was unveiled to the public for the first time, a sense of starstruck swept over those in attendance. The G1 sold for 2,900 yen, which was 200 yen less than the trucks imported by Ford or GM.[126] Two weeks later, the trucks were displayed at a similar presentation in Nagoya at a dealership where they were sold. In 1936, after multiple hurdles, Toyoda's vehicles were available for purchase. The two types of cars offered were the AA model and the AB convertible model as well as the GA truck, a modified version of the G1. Kiichiro had created Toyoda automotive and been awarded one of only two auto-manufacturing licenses across Japan.[127] As the year came to a close, Toyoda started to benefit from the automotive industry and he purchased land to relocate the business to a fresh site.

Kiichiro wanted to produce outside of Nagoya, but still use Nagoya's resources for sales and shipping. Two sites outside of Nagoya were purchased, with Kariya being the first to construct an assembly plant and the second location in Koromo-cho being the larger of the two sites at two million square acres.[128] By this time, Nagoya had expanded well eastward past its 1890 boundaries. The new Kariya plant on 50,000 square acres of land sat approximately thirty-three kilometers southeast of Nagoya. To the east approximately forty kilometers sat Koromo-cho, in preparation for a large-scale factory to rival American automotive companies. At this time, a contest was held for a fresh logo since the last one catered to the loom works business.

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[126] Togo and Wartman, *Against All Odds*, 65-66.

[127] Togo and Wartman, *Against All Odds,* 72 and Toyota Motor Corporation, "Toyoda Automatic Loom Works Designates a Licensed Company under the Automotive Manufacturing Industries Law," *75 Years of Toyota*: (2012), accessed September 9, 2020, https://www.toyota-global.com/company/history_of_toyota/75years/text/taking_on_the_automotive_business/chapter2/section2/item7.html. The other auto-manufacturing license went to Nissan. They began as an automotive company in the 1930s, right as Toyoda transitioned from loom works to an automotive company. They were more prominent in the Tokyo rather than Nagoya.

[128] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 66. Koromo-cho ends up becoming Toyota City, where Toyota's global headquarters resides currently.

After scouring through twenty-seven thousand entries, board of Toyoda representatives selected one that encompassed Toyoda in a circle. However, a minor change in the refurbished logo occurred regarding the word "Toyoda." The kanji for "Toyoda" consist of ten brush strokes when written out, but "Toyota" requires eight brush strokes, a lucky number that suggests growth in Japanese.[129]

While Toyota and Mitsubishi had grown to dominate Nagoya's prewar industries, one was soon to experience immense destruction from American bombing raids while the other relocated and remained unscathed. By the end of the 1930s, Nagoya had grown into a vibrant city. It became one of the country's top five cities in terms of population, economy, and tourism. The population eclipsed 1.3 million in 1940.[130] However, war was soon to have an influence. For Toyota, being outside of Nagoya was a blessing in disguise, but for Mitsubishi it was a long-term setback. While both companies were wartime targets, eliminating A6M1 Zero fighters had priority over obliterating trucks. As the old proverb says, "what goes up, must come down," and for Nagoya what was about to come down was hellfire from B-29s dropping conflagration bombs on civilians, factories, and anything in Allied sights.

[129] Weston, *Against All Odds*, 73.
[130] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed September 7, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

Chapter Two:

The Temporary Hellfire Setback:
America's Pacific War Bombing of Nagoya, 1931-1946

To prepare for the Fifteen Year War, Japan committed to aircraft construction, with Nagoya's Mitsubishi facilities taking the production lead. Nagoya continued to thrive economically as aircraft manufacturers built a sizeable air force, and Mitsubishi reached a peak of 15,667 employees in 1929, on the cusp of the war's outbreak.[131] This amount represented nearly one-tenth of all workers employed in manufacturing.[132] Once the Fifteen Year War began in September 1931, Mitsubishi needed additional employees to maintain production. However, the start of the war led to labor shortages. Their 1929 interwar peak dwindled from 15,667 employees to 10,767.[133] While the number of Mitsubishi's employees decreased, Nagoya's population increased by slightly under 8,000 citizens.[134] This rise in population was not unusual, as the Japanese migrated from rural to urban areas due to the better job opportunities manufacturing created.

The population increase in the early years of the war provided larger numbers of citizens to Mitsubishi for its labor force. As the Japanese migrated into the city, they sought employment, which was primarily offered by manufacturing companies, especially with the outbreak of the war. By 1934, the number of employees at Nagoya's Mitsubishi air production facility had nearly doubled from the 1933 total of 12,451 to 23,752.[135] The combination of urban migration,

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[131] 三菱重工業 (Mitsubishi Heavy Industries), 三菱重工業株式会礼史 (History of Mitsubishi Heavy Industries Stock Company) (東京, 來京®千代丸 [Tokyo, Kikyo Chiyomaru]: 三菱重工業株式会礼 [Mitsubishi Heavy Industries Stock Association], 1956), 194.

[132] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-13 Number of Employees by Industry Major Category (Taisho 19 to 1985), data visualization by Nagoya City Hall, accessed December 29, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

[133] 三菱重工業 (Mitsubishi Heavy Industries), 三菱重工業株式会礼史 (History of Mitsubishi Heavy Industries Stock Company) (東京, 來京®千代丸 [Tokyo, Kikyo Chiyomaru]: 三菱重工業株式会礼 [Mitsubishi Heavy Industries Stock Association], 1956), 194-195.

[134] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed December 29, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

[135] 三菱重工業 (Mitsubishi Heavy Industries), 三菱重工業株式会礼史 (History of Mitsubishi Heavy Industries Stock Company) (東京, 來京®千代丸 [Tokyo, Kikyo Chiyomaru]: 三菱重工業株式会礼 [Mitsubishi Heavy Industries Stock Association], 1956), 195.

increasing capacity of the air works facility, and the high labor demand all factored into the rapid increase in workers. The Japanese military began to implement plans for the production of airplanes by Mitsubishi. These orders led to the production of the Type 96 carrier-borne fighter. Around 1,000 Type 96 aircraft were produced, with Nagoya's Mitsubishi Air Works facility taking the lead production of nearly eighty percent of the aircraft.[136] This production equipped Japan for the early years of the Fifteen Year War and also made Nagoya a prominent target in the future.

America applied a similar production strategy as Japan in building up aircraft to meet the military's wartime needs. This led to American transforming automotive factories into aircraft production facilities. The Willow Run plant near Detroit, Michigan is a common example of this. The U.S. government funded two million USD into a site owned by Ford Motor Company and transformed it into an aircraft production plant that produced primarily B-24s.[137] This mass aircraft production prepared America for fighting in a global war.

To ensure unfettered access to the natural resources of the Dutch East Indies at the end of 1941, Japan attacked Pearl Harbor, the Philippines, and Singapore. These attacks created a protective envelope for the Japanese procurement of resources that would allow them to continue their conflict on the Asiatic mainland. Simultaneous to the Pearl Harbor attack, Japan also conducted attacks against Guam, Thailand, Wake, and Hong Kong to conquer as much territory

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[136] Akira Yoshimura, *Zero Fighter* (Westport, CT: Praeger Publishers, 1996), 17. At the time, the Zero Fighter had not been invented yet. That did not occur until 1940. Until the Zero Fighter's creation, the Mitsubishi Type-96 fighter was Japan's top preforming fighter. Out of the 1,000 produced during 1937, Nagoya contributed to 782. The remaining craft came from Sasebo Naval Yard and Kyushu Airplane Company. No precise numbers from the latter two factories are given.

[137] Detroit Historical Society, "Willow Run," Encyclopedia of Detroit, accessed January 7, 2021, https://detroithistorical.org/learn/encyclopedia-of-detroit/willow-run#:~:text=Willow%20Run%20is%20an%20Albert,%24200%20million%20to%20the%20project.

and resources as possible.[138] The success of these attacks showed the usefulness of airpower as a valuable weapon and led to Japan investing into its production as the Pacific War progressed.

The primary military investments were in Nakajima Air Works, Mitsubishi Air Works and Aichi Air Works for the aircraft and the Yokosuka Naval Air Arsenal for carriers. The production of Mitsubishi's "Type 96" and "Type 0" (Zero Fighter) carrier fighters and Aichi's "Type 99" dive bomber spearheaded Japan's direction.[139] Since Nagoya contained two of the three prominent aircraft manufacturers, the need for labor was high and the city's population reached a peak of 1.3 million.[140] This wartime growth also made the city a key target once America entered the war.

After these surprise attacks, America sought retribution. In April 1942, Americans received a minor lift to morale from the Doolittle Raid.[141] The Doolittle Raid demonstrated that American airpower was capable of penetrating Japan's protective envelope. However, because the raid consisted of only sixteen aircraft and was for minor morale purposes, it was not worthy of much significance.

The American military spent the better parts of the Pacific War in 1942-1944 fighting Japan through the island-hopping campaign. The two foes met on various islands in the Pacific

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[138] Department of Military and Engineering, *The War with Japan: Part 1, December 1941-August 1942* (West Point, NY: United States Military Academy, 1950), 11-12.
[139] David C. Evans, *Kaigun: Strategy, Tactics, and Technology in the Imperial Japanese Navy, 1887-1941* (Annapolis, MD: Naval Institute Press, 2012), 307.
[140] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed January 6, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html.
[141] The USS *Hornet* carried American B-25 bombers within 600 miles of Japan's coast. From there, sixteen bombers flew to Japan and bombed Tokyo, Yokohama, Nagoya, Osaka, and Kobe. Not much of strategic value resulted from the bombing, but it raised American morale four months after the Pearl Harbor attack. It also proved that Japan had weak anti-aircraft defense systems in place in case of future American bombing raids. As the Pacific War progressed, Japanese anti-air defense weakened substantially, from its already meager origins. For further clarification about the Doolittle Bombing refer to Paolo E. Coletta, "Launching the Doolittle Raid on Japan, April 18, 1942," *Pacific Historical Review* 62 no. 1 (1993).

and fought for control over the scarce land. Japan wanted the islands as buffers to hold their positions across Asia. America wanted the islands to inch closer to Japan's mainland and establish airfields within striking distance of the mainland for strategic bombing raids. The American air campaign against Japan ramped up by mid-1944 and lasted until the end of the Pacific War. American objectives focused on eliminating Japanese wartime production facilities. The most efficient way to curtail Japanese manufacturing came through heavy bombing raids. In a span of fourteen months, sixty-seven Japanese cities, including Nagoya, were heavily bombed by American aircraft.[142] Because Nagoya produced a high percentage of wartime aircraft, the city became a primary target. By the war's end, Nagoya was demolished and searching for a path to postwar reconstruction.

Bombing of Japan's home islands began in June 1944 with *Operation Matterhorn*. However, due to the long distances between India to China and China to Japan, flying over the Himalayas, and the limited radius of the newly created B-29 Superfortress, only portions of Kyushu were susceptible to U.S. bombing raids.[143] The first raid targeted Yawata's Imperial Iron and Steel Works, and the last concluded with an attack on Omura's small aircraft factory in January 1945.[144] A total of nine raids were conducted against the Kyushu cities of Yawata, Sasebo, Omura, and Tobata. America experienced limited success as supplies transferred from Bengal to Chengdu proved to be incredibly arduous due to flying over the Himalayas.

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[142] The fourteen months range from June 1944 to August 1945. This does not include the Doolittle Raid. Only the raids involved in Operation *Matterhorn* and beyond. Digital Text International, "67 Japanese Cities Firebombed in World War II," Digital Text International.com, Accessed April 16, 2021, http://www.ditext.com/japan/napalm.html.
[143] Daniel L. Haulman, *Hitting Home: The Air Offensive Against Japan* (Washington D.C.: Air Force Historical Studies Office, 1999), 10. The B-29 only had a radius of 1,600 miles (2,600 km). The American air strips were constructed in Chengdu, which only put Kyushu in the B-29s' 1,600-mile range. This issue already limited the American bombing raids before they began.
[144] Barrett Tillman, *Whirlwind: The Air War Against Japan 1942-1945* (New York City: Simon and Schuster, 2010), 56-58.

Additionally, B-29s had numerous mechanical issues forcing them to abort missions and return. If B-29s did reach Kyushu, the swift jet stream and high cloud coverage often hampered their bombing accuracy. Of the nine raids, American airpower only destroyed one aircraft factory located in Omura. XX Bomber Command lost 125 B-29s during the Kyushu raids.[145] Overall, Operation *Matterhorn* resulted in a failure for American aircrews due to the inefficiencies of bombing Japan from the Chinese interior.

The battle that became pivotal for America's goal of strategic bombing was the Battle of Saipan in June and July 1944. The three-week battle began with American troops landing amphibious vehicles on the beaches. The invasion fleet sailed from Pearl Harbor on June 5, 1944, the day before D-Day (*Operation Overlord*) in Europe, coining the Battle of Saipan "D-Day in the Pacific."[146] Once American forces landed on Saipan, they were met by stiff, but not insurmountable Japanese resistance.

Once on the island, it became apparent that the terrain posed a problem. The island was seventy-two square miles—larger than the islands previously fought on—with a landscape that consisted of flat cane fields, swamps, cliffs, and the daunting 1,554-foot-high Mount Tapotchau.[147] American forces knew this type of terrain favored the Japanese, as they were in defensive positions and able to blend in and hide for guerrilla warfare. The turning point of the Battle of Saipan came when the Americans forced the Japanese to retreat toward Mount Tapotchau. By July 9, American forces claimed Saipan a "secure site." Japan suffered 23,811 known dead with others sealed in caves or scorched by flamethrowers. America had 3,225 killed

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[145] Tillman, *Whirlwind,* 10. A large portion of the 125 B-29s lost came from mechanical errors or the long traveling distances resulting in pilots returning to base and/or crashing.
[146] Captain John C. Chapin, USMCR (Ret.), "Breaching the Marianas: The Battle for Saipan," *Marines in World War II Commemorative Series* (1994): 2.
[147] Captain John C. Chapin, USMCR (Ret.), "Breaching the Marianas: The Battle for Saipan," *Marines in World War II Commemorative Series* (1994): 6.

and 13,061 casualties.[148] The significance of the Battle of Saipan was that it became the de-facto airfield for the B-29 bombers in their bombing missions. Once Japan lost Saipan, it became a matter of *when*, not *if*, Nagoya and other Japanese cities would be bombed.

As Americans inched closer to the Japanese archipelago, Japan sought to stem the tide and military orders for aircraft reached an all-time high. By late 1944, Mitsubishi was nearing its peak in airframe and engine production, and by December, they were producing 114,148 airframes and 90,705 engines per month. Employment rose to 204,853 and averaged 191 man-hours per month.[149] Until December, Mitsubishi was flourishing in every aspect. However, Mitsubishi's success was about to come to a screeching halt as events unfolded that sealed the fate of Mitsubishi Air Works in Nagoya.

The first significant event was geographical. In late 1944, two earthquakes weakened the foundations of Nagoya's industry. The 7.9 magnitude Tonanaki earthquake on December 7, 1944, was followed by the 6.8 magnitude Mikawa earthquake on January 13, 1945. The combination of these two earthquakes impacted aircraft production. The No. 11 plant in Dotoku ward sustained fifty-percent damage from the Tonanaki earthquake. Plant Nos. 1, 3, and 5 in the Oe-machi ward received less than five-percent damage which was still enough to contribute to their demise.[150] Between the earthquakes and the initial bombing raids that started on December 12, Mitsubishi's production decreased by ninety-seven aircraft in December 1944.[151] Had the earthquakes hit on their own, Mitsubishi would likely have recovered in a couple of weeks. For

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[148] Captain John C. Chapin, USMCR (Ret.), "Breaching the Marianas: The Battle for Saipan," *Marines in World War II Commemorative Series* (1994): 36.
[149] The United States Strategic Bombing Survey, "The Air Attacks," *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947), 15.
[150] The United States Strategic Bombing Survey, "The Air Attacks," *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947), 20.
[151] The United States Strategic Bombing Survey, "Mitsubishi No. 3 Airframe Works (Plant Report No. 1-3)," *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947), 111.

Aichi Air Works, the two earthquakes only had a minor impact on production. While production capacity declined in December, it rebounded with peak production of 125 engines per month for the following two months.[152] The earthquakes occurring a few days before the first air raids on Nagoya were an ominous beginning to the decline of the city's aircraft manufacturers, population, and economy.[153]

The second aspect that led to Nagoya's demise was the change in American bomber commands from Gen. Haywood Hansell to Gen. Curtis LeMay. LeMay replaced Hansell because of the difference in perceptions in using incendiary attacks. Hansell was reluctant to switch from daylight precision attacks, which were largely unsuccessful.[154] Incendiary attacks were first used in World War I by German Zeppelins. However, it was not until World War II that the tactic was applied on a larger scale, especially by the American military.[155] The American military made incendiary raids standard during the Pacific War because of the Japanese cities' susceptibility to fire, advanced airpower technology, and revised airpower doctrines. The fires of the 1923 Great Kanto Earthquake heightened the use of incendiary attacks, too, as the incident demonstrated

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[152] The United States Strategic Bombing Survey, "Atsuta Plant, Aichi Aircraft Company*," Aichi Aircraft Company: Corporation Report* no. v (1947): 43.

[153] Aside from the scarce information within the USSBS and a few scholarly articles, not much information is given on the wartime earthquakes. This is because the Japanese government did not want to reveal any home front weaknesses that might aid American bombing or wartime efforts. Not reporting on the earthquakes was the best way to ensure that American military was unaware of them and the damage to Nagoya's aircraft manufacturers. The lack of reporting has led to very few primary sources detailing the earthquakes' aftermath.

[154] Shockingly, Nagoya was the lone city that Gen. Hansell had success within precision daylight raids. The December 13th and 18th attacks damaged Mitsubishi's aircraft engine factory. A total of 470 tons of bombs were dropped on Mitsubishi's aircraft production facility. Slightly above 1.6 million square feet of total production floor area had been destroyed from the two precision attacks. This destruction estimated to be around 3,519 square feet destroyed per ton of bombs. However, because Gen. Hansell did not have success with precision raids anywhere else in Japan, he was replaced by Gen. LeMay who took charge of XX and XXI Bomber Command.

[155] Douglas H. Robinson, *Zeppelin in Combat: A History of the German Naval Airship* (Atglen, PA: Schiffer Military History, 1997), 250.

Japanese cities' vulnerability to fire.[156] This notion was reemphasized twenty-two years after the earthquake when America began bombing Japan.

When LeMay took over in early 1945, Hansell highlighted several problems experienced when bombing Japanese cities. The problems Hansell observed with precision bombings were inaccuracies, a high abortive rate, and bomb dispersion.[157] Japanese infrastructure, built from wood and rice paper, posed an additional issue as buildings often withstood precision bombings. LeMay focused on improving these weaknesses. He also focused on the impact of incendiary bombs due to the flammable composition of Japanese cities.

LeMay knew the technology did not exist for high altitude bombing. The drift-rate-jet stream was simply too strong at high altitudes.[158] He decided to lower the bombing altitude from 10,000 to 5,000 feet to gain accuracy. The lower altitude bombing also led LeMay to fly at night

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[156] Michael S. Sherry, *The Rise of American Air Power: The Creation of Armageddon* (New Haven, CT: Yale University Press, 1987), 112. America media, *U.S. News*, often speculated that American bombers were going to bomb Japanese cities made of "rice-paper and wood houses." This led to misnomers that America would have unprecedented success in bombing the cities made completely of "rice-paper and wood."

[157] Daniel T. Schwabe, *Burning Japan: Air Force Bombing Strategy Change in the Pacific* (Lincoln, NE: University of Nebraska Press, 2015), 106. The scholarship on the incendiary attacks against Japan is weak and often done by scholars that are not trained historians, such as Schwabe. While Schwabe has produced one of the better sources on the subject, there are no Japanese sources within it. This only shows one perspective from the bombings. However, he does point out that Japanese cities were susceptible to fire, which parallels this research and the impact the Great Kanto Earthquake had in swaying incendiary attacks. Werrell's monograph shows more complexity compared to Schwabe's work. Werrell does not have Japanese sources either, but he is a trained historian, whereas Schwabe is an aerospace engineer. The main issue with Werrell's work is it makes an illogical argument regarding the reasoning for LeMay altering strategic bomber doctrine, which was the inability of the B-29's engine to sustain high altitudes. This was true, but not the reason for LeMay changing the doctrine. The doctrine was changed for multiple reasons. The lack of technology, jet stream drifts, flammability of Japanese cities and accuracy all contribute to LeMay's decision. Werrell focuses primarily on the B-29's origins rather than the bombings themselves. This hampers the scholarship as it seems the book is largely about B-29s rather than the bombings. In general, historical scholarship appears outdated in regard to incendiary attacks against the Japanese.

[158] Schwabe, *Burning Japan*, 117.

and aim at targets with nighttime radar or visuals on ablaze structures.[159] Japanese air defenses, which had been minimal in the best of times were practically non-existent by this time.[160]

LeMay also removed guns, ammunition, and gunners from the B-29 planes to store more M-69 incendiary bombs. The last change LeMay called for was a requirement of at least 400 planes for an efficient firebombing raid.[161] These changes ensured that firebombing was going to be effective and produce widespread destruction across Japanese cities. Japan had too few poorly trained and ill-equipped firefighters to effectively deal with the impending devastation.[162] The first major bombing raid against Nagoya occurred on December 12, 1944, and targeted the Mitsubishi Air Works and Kawasaki Airplane Factory.[163] From this point, LeMay's restructured methods came into effect and caused massive damage to Japanese cities, including Nagoya.

The American military bombed Nagoya from December 1944 to August 1945. The northeast and southwest sections took the brunt of the blows. The northeast section contained Nagoya Castle, which had been converted into a military barracks and training facility during the war. The 3rd Division headquarters and 5th Brigade headquarters, along with the 6th Infantry Regiment, 3rd Field Artillery Regiment, and 3rd Battalion Engineer corps, were stationed within

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[159] Kenneth P. Werrell, *Blankets of Fire: U.S. Bombers over Japan during World War II* (Washington D.C.: Smithsonian Institution Press, 1996), 154.

[160] Schwabe, *Burning Japan*, 117. The Japanese had weak anti-air defense systems as well. The systems they did have in place, they lacked manpower to operate them. At this point in the Pacific War, the Japanese were hurting in all facets and had minimal resources.

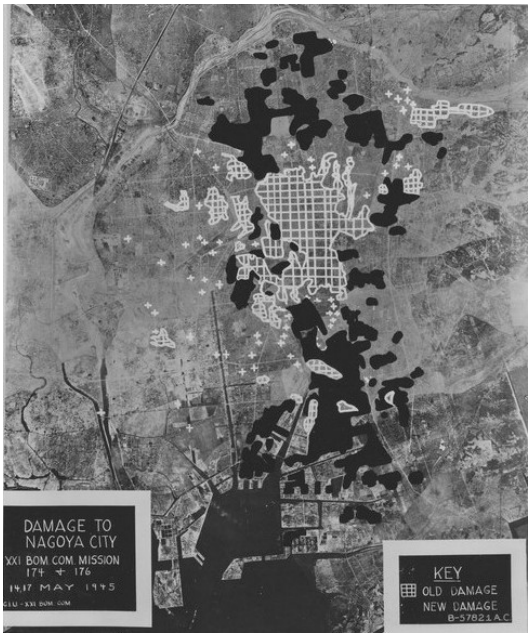
[161] Werrell, *Blankets of Fire,* 157.

[162] Werrell, *Blankets of Fire*, 156. Tokyo only had a total of 8,000 firefighters, with limited experience. The only other protection for citizens were either the few bomb shelters available or self-protection. Tokyo had few bomb shelters due to the limited resources and the unstable soil, which could not support the shelters. One common self-protection program established firebreaks up to 150 feet wide. Around ten percent of the Tokyo's infrastructure were demolished to create these firebreaks. Overall, Tokyo and fellow Japanese cities lack sufficient defense weaponry and programs against American bombing raids.

[163] _____ "Civilian Pilot on Test Flight Damages One B-29 During Recent Raid Over Nagoya," *Nippon Times* (Tokyo, Japan), Dec. 18, 1945 and The United States Strategic Bombing Survey, "The Air Attacks," *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947). Haywood Hansell commanded these first two December raids, and used precision bombing instead of area bombing. Curtis LeMay took over XX and XXI Bomber Commands in January 1945, replacing Haywood and switched from precision to area bombing.

the castle compound. The grounds contained a few military necessities such as a garrison hospital, drill ground, and storage facilities.[164] The southwest section included the cluster of aircraft production factories. Mitsubishi Air Works was adjacent to Aichi Air Works on Ise Bay, making them vulnerable to the same airstrikes.[165] These production factories became the primary targets in southwest Nagoya.[166] The remainder of the southwest portion of the city remained relatively unscathed.

Figure 1: Damage to Nagoya Before and After May 1945



United States National Archives, "Damage to Nagoya City—XXI Bomber Command Mission 174 & 176," May 18, 1945.

The Japanese had limited successes in their defenses against the air raids. A rare success occurred on January 23, 1945. Sixty-three out of seventy American planes were shot at and

[164] The United States Army Map Service Chief of Engineers, *Nagoya Northeast, Aichi-Ken, Honshu, Japan* [map], Scale: 1:12,500, Washington D.C.: The United States Army, 1946.
[165] Network2010, "Nagoya in the early Showa period 'Mitsubishi Heavy Industries Nagoya Aircraft Mfg. Co., Ltd.," Network2010, accessed January 9, 2021, http://network2010.org/article/152. This website has various maps from the prewar Showa era and images of Mitsubishi that demonstrate the manufacturer's location.
[166] The United States Army Map Service Chief of Engineers, *Nagoya Southwest, Aichi-Ken, Honshu, Japan* [map], Scale: 1:12,500, Washington D.C.: The United States Army, 1945.

damaged. Thirteen of the sixty-three were downed.[167] However, these instances of success were uncommon. Mitsubishi was targeted a total of twenty-two times, between December and July, with only six raids failing to hit the production site. B-29 bombers dropped 4,356 tons of bombs, with 2,911 targeting engine production facilities and 1,445 aimed at airframe plants. Nearly twenty percent were known to have struck the Mitsubishi facilities in some capacity. The most effective attack came on April 6, 1945, when 614 tons of bombs were dropped on the factories. Nearly one-half of production at the Nagoya site was devastated in this single bombing incident.[168] By the time, Japanese surrendered on August 15, 1945, Nagoya's Mitsubishi facilities had suffered catastrophic bombings. Statistics vary on the destruction for each plant ranging from five percent to sixty percent. Overall, the square footage of the production floor area decreased from its peak of 9.25 million square feet to slightly above 6 million square feet in August 1945.[169] Mitsubishi remained on the map, but enough damage occurred to halt the Japanese aircraft production at the latter stages of the war. Between the earthquakes and the bombings, Nagoya's aircraft industry was destroyed.

[167] ——— "63 B-29's Smashed Over Nagoya Skies In Daylight Skies: 13 Planes Downed, About 50 Damaged, Imperial Headquarters Disclosed," *Nippon Times* (Tokyo, Japan), Jan. 25, 1945.
[168] The United States Strategic Bombing Survey, "The Air Attacks," *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947), 18.
[169] The United States Strategic Bombing Survey, "The Corporation and Its Importance in the Aircraft Industry," *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947), 2.

Figure 2: Nagoya After the Pacific War Bombings

(毎日新聞) Mainichi Shinbun, "Nagoya after the 1945 air raid," 1945.

Once American aircrews destroyed large cities, they turned their sights to smaller cities. In June 1945, the incendiary raids against smaller cities began. The first cities attacked were Hamamatsu, Kagoshima, Omuta, and Yokkaichi. From June until August, cities across Japan were bombed, including Himeji, Gifu, Shimonoseki, Nishinomiya, and nearby Ichinomiya.[170] In the midst of firebombing smaller cities, XXI Bomber Command elected to drop millions of propaganda leaflets.[171] The American objective was to warn the Japanese about upcoming bombing raids, and encourage quick surrender. Around the same time as American aircrews dropped leaflets, preparations went into planning the largest raids of the entire war. In the last few weeks of the war, over 800 bombers dropped 6,100 tons of bombs on Mito, Toyama, Nagaoka, and Hachioji.[172] Four days later, Imabari, Maebishi, Saga, and Nishinomiya

[170] Bartlett E. Kerr, *Flames Over Tokyo: The U.S. Army Air Force's Incendiary Campaign Against Japan 1944-1945* (New York City: Donald I. Fine, Inc., 1991), 262.
[171] Ferenc Morton Szasz, ""Pamphlets Away": The Allied Propaganda Campaign Over Japan During the Last Months of World War II," *The Journal of Popular Culture* 42 no. 3 (2009): 535.
[172] Kerr, *Flames Over Tokyo*, 267-268.

experienced a similar fate. A few of these cities experienced near 100 percent infrastructural damage. The smaller area of these cities and the high number of aircraft used led to significant damage.

American Bomber Commands never attacked Koromo (Toyota City), a small city located near Nagoya. Because of Japan's diminished resources, bombing Toyota's production facilities was not prioritized. Japanese limited resources meant the trucks Toyota put together were often incomplete, and a lack of fuel meant they had a limited range if any at all. That Koromo was not bombed implies American Bomber Command did not see any significance in attacking the Toyota production site. Also, during the Nagoya raids, Koromo served as a landmark as aircrews prepared to attack Mitsubishi Air Works. Once American bombers made it to Koromo, the pilots knew to veer left, setting up their sights on the Mitsubishi factories. Once they turned to the left, the canals framed the target within the B-29's bombsights.[173] Koromo's survival meant that Nagoya had a path to economic postwar recovery. Toyota had the opportunity to become Aichi Prefecture's top economic producer in the future.

By the war's end, Nagoya was significantly damaged. Thirty-seven percent of the city was destroyed, with twenty-one percent of the city's industrial infrastructure in ruins.[174] The twenty-one raids that targeted Nagoya can be divided into precision and area bombings. The precision bombings used high explosive bombs, whereas the area bombings used M-69 incendiary bombs, which caused widespread damage. There were only six area bombing raids, but they dropped slightly over 10,000 tons of incendiaries. These six area raids accounted for

[173] United States Army Air Forces, *Hesitation Upwind: Nagoya Bombing Mission*, Narrated by Ronald Reagan (1944-45; Washington D.C., United States Army Air Forces), First Motion Picture Unit Training Film.
[174] The United States Bombing Survey, "Summary and Conclusions; Effects of Air Attacks on the City of Nagoya," *The Effects of Air Attacks on the City of Nagoya*, no. 1: (1947), 2.

seventy-one percent of the bomb tonnage dropped on the city.[175] Juxtaposed against this, the precision raids, which accounted for under thirty percent of the bombs dropped, led to more deaths with less destruction of infrastructure. The bombings killed a total of 8,152 people in Nagoya, but the precision raids accounted for seventy percent of those deaths.[176] Area bombings caused more damage to infrastructure. There were 60,877 houses destroyed, with ninety percent being from area bombings.[177] Nagoya is a unique instance where firebombing resulted in a higher rate of damage to infrastructure compared to casualties. Most Japanese cities bombed with incendiary bombs had higher casualty rates. This unusual bombing pattern made Nagoya an outlier from the other Japanese cities.[178] The population had decreased to 597,941 by the war's end, the lowest since 1920.[179] Nagoya was set back economically, infrastructurally, and their population was at a two-decade low.

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[175] The United States Bombing Survey, "Summary and Conclusions; Effects of Air Attacks on the City of Nagoya," *The Effects of Air Attacks on the City of Nagoya*, no. 1: (1947), 2-8.

[176] The total deaths from precision raids were 5,669 out of 8,152.

[177] The United States Bombing Survey, "Summary and Conclusions; Effects of Air Attacks on the City of Nagoya," *The Effects of Air Attacks on the City of Nagoya*, no. 1: (1947), 8. The total houses destroyed from area bombings were 54,959 out of 60,877. Additionally, 519,205 citizens lost their homes or became homeless, with 434,032 of these resulting from area bombings. These statistics demonstrate the damage area bombing had on Nagoya's infrastructures.

[178] Nagoya's lower causality rate compared to infrastructural damage is unique. Most Japanese cities had more casualties or roughly equal statistics compared to infrastructural damage. One reason for Nagoya being an outlier is the city's geography. It was relatively simple to keep area bombing away from the residential areas. Mitsubishi's production facilities were surrounded by Ise Bay and other manufacturing companies. The same is true for Aichi Air Works' location. When American bombers attacked these two aircraft producers the bombs either hit the facilities or the water. The residential area of Nagoya was in the northern portion of the city, opposite of the aircraft factories. The military barracks around Nagoya Castle were also in the northern portion of the city. This location did pose a threat to the residents. However, because of the sheer size and obtrusion of the Nagoya Castle, avoiding residential sectors of northern Nagoya was feasible. All of these geographical factors limited the casualty rate in Nagoya, making the city an outlier in comparison to other Japanese cities after the bombing raids.

[179] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed January 9, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html.

Table 1: Nagoya-Summary of Bombing Attacks

Year-Month	Type of Attacks (# of attacks)	Tons of Bombs Dropped (Type of Attack)
1944-December	Precision (3) Area (0)	470 (Precision)
1945-January	Precision (2) Area (2)	183 (Precision) 232 (Area)
1945-Febuary	Precision (1) Area (0)	105 (Precision)
1945-March	Precision (2) Area (2)	1,597 (Precision) 3,746 (Area)
1945-April	Precision (1) Area (0)	153 (Precision)
1945-May	Area (2)	6,023 (Area)
1945-June	Precision (5)	1,094 (Precision)
1945-July	Precision (1)	451 (Precision)[180]

Bombing Nagoya was vital to limit the production of the Mitsubishi Zero Fighter. Before the Pacific War, Mitsubishi produced over 12,000 aircraft, constituting seventeen percent of the Japanese wartime fleet.[181] During the war, 14,300 A6M Zeroes were manufactured, the highest production number of any Japanese aircraft.[182] While Nagoya was not the production site them, they were the largest, making them a critical target for bombing. The A6M Zero was the top fighter plane for the Japanese during the Pacific War, and Mitsubishi Heavy Industries in Nagoya was crucial for Japanese success.

[180] The United States Bombing Survey, "Summary and Conclusions; Effects of Air Attacks on the City of Nagoya," *The Effects of Air Attacks on the City of Nagoya*, no. 1: (1947), 8. Table 1- Nagoya Summary of Attack Data.
[181] The United States Strategic Bombing Survey, "The Corporation and Its Importance in the Aircraft Industry," *Mitsubishi Heavy Industries, LTD: Corporation Report* no. 1: (1947), 1.
[182] Richard J. Samuels, *Rich Nation, Strong Army: National Security and the Technological Transformation of Japan* (Ithaca, NY: Cornell University Press, 1994), 118.

It is essential to understand the significance behind the bombings of Nagoya. The twenty-one bombings crushed the city. Once the bombings ceased, two silver linings could be perceived going into the postwar period. First, Nagoya had relatively fewer citizens perish from the bombings than other Japanese cities. While the bombings did destroy much of the infrastructure in Nagoya, it was possible to rebuild these damaged areas. To rebuild, Nagoya needed to establish a new leading economic core for the city.

Table 2: Damage to Homes and People in Nagoya

Type of Attack	**Homes Completely Destroyed**	**Homes Badly Damaged**	**People Left Homeless**	**People Killed**	**People Injured**
Precision	5,918	4,270	85,173	5,669	4,386
Area	54,959	2,164	434,032	2,483	5,709
Total	60,877	6,434	519,205	8,152	10,095 [183]

Luckily, the second silver lining was that Toyota Automotive was spared. During the war, the company continued to make trucks for the Japanese war effort. Even when resources became scarce, the military continued to order the company to produce trucks. These trucks may have left the assembly line with one headlight, only rear-wheel brakes, wooden cabs, running boards, and rear beds, but they continued to be built.[184] These orders allowed the military to receive trucks but, more importantly, kept a prominent Aichi company running. There were plans to bomb Toyota, but they were shelved once the Japanese surrendered. The war had ended, but

[183] The United States Bombing Survey, "Summary and Conclusions; Effects of Air Attacks on the City of Nagoya," *The Effects of Air Attacks on the City of Nagoya*, no. 1: (1947), 9. Table 2- Nagoya Damage to Homes and People.
[184] Yukiyasu Togo and William Wartman, *Against All Odds: The Story of the Toyota Motor Corporation and the Family That Created It* (New York: St Martin's Press, 1993), 84.

the reconstruction had just begun. Toyota was still producing vehicles, and portions of the southeast, southwest, and northwest of the city were still intact. With a reconstruction plan in the development stages, Nagoya had a prosperous postwar future. Nagoya's leaders were about to witness a transformation of the city into a global automotive hub. The hellfire that rained down from B-29 aircraft was a setback, but the American's involvement in the Korean War was about to provide the postwar comeback for Nagoya.

Chapter Three:

From Military Aircraft to Commercial Automobiles: The Post-Pacific War Reconstruction and Korean War Impact on Aichi Prefecture's Economy and Urbanization, 1946-1960

The Pacific War came to an end on August 15, 1945, as millions of Japanese citizens sat near radios listening to the emperor announce surrender. For many of the Japanese citizens, it was the first time they heard the Emperor's voice. The same majority of citizens had no idea what their future held for them with the Japanese surrender. Nearly three million Japanese citizens, four percent of the total population, died due to the war. Around seventy Japanese cities were burned in some capacity, leaving citizens homeless with no prospect of relocation. American bombing raids destroyed one-quarter of the physical structures in Japan, including one-third of industrial factories.[185] Nagoya was a major victim of this as the city had been left nearly forty percent destroyed.[186] The destruction statistics of the city's prominent wartime factories of Mitsubishi Air Works and Aichi Air Works vary by each plant, but were anywhere from five to ninety-five percent destroyed.[187]

Nagoya's economy remained in the same state as the rest of Japan. Once Japan signed the surrender documents aboard the U.S.S. *Missouri* on September 2, the redevelopment of Japan in every sphere became an Allied, primarily American, responsibility. The man to bear the responsibility of rebuilding Japan was none other than General Douglas MacArthur. Once MacArthur took charge of restoring Japan, a slew of economic and political changes occurred from east to west, including the redevelopment of Aichi Prefecture's economic and industrial production. Aichi Prefecture's postwar economy transitioned from aeronautical production to automobile production because of the economic policies the Allied Occupation implemented,

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[185] Takemae Eiji, *The Allied Occupation of Japan* (New York City: Continuum International Publishing, 2002), xxxviii.
[186] The United States Strategic Bombing Survey, "Summary and Conclusions," *The Effects of Air Attacks on the City of Nagoya* no. 1: (1947), 2.
[187] The United States Strategic Bombing Survey, "The Air Attacks," *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947), 18-21 and The United States Strategic Bombing Survey, "The Air Attacks*," Aichi Aircraft Company: Corporation Report* no. v: (1947), 11.

and American military needs during the Korean War. This triggered the "Second-Economic Miracle."

A five-star general and no stranger to East Asia, MacArthur was set to take over Japan's reconstruction. MacArthur became the Supreme Commander for the Allied Power (SCAP), which allowed him to heavily influence political decision making in rebuilding Japan.[188] The Allied plan for postwar Japan originated in July 1945 at the Potsdam Conference. The conference allowed Allied leaders, U.S. President Harry Truman, British Prime Minister Winston Churchill, and USSR Premier Joseph Stalin, to lay the foundation of the US Initial Post-Surrender Policy for Japan.[189] Once Japan signed the surrender documents and MacArthur became SCAP the US Initial Post-Surrender Policy was initiated. This became the first set of postwar restrictions against Japan and established the path for Aichi's restructured economy.

The Post-Surrender Policy had two main objectives, to ensure Japan was never again a global menace and to establish a peaceful and responsible government that mirrored American political ideals and principles.[190] Multiple micro-principles were issued to achieve these two objectives, two of which affected Aichi's economy. The first one was the elimination of the zaibatsu.[191] The zaibatsu was a large part of Aichi's prewar economic success. The idea for Allied powers' zaibatsu dissolution stemmed from wanting to demilitarize and democratize

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[188] Michael Schaller, *The American Occupation of Japan: The Origins of the Cold War in Asia* (Oxford: Oxford University Press, 1985), 22.
[189] It is important to note that Churchill left the Potsdam Conference before any decisions were made. He lost the 1945 United Kingdom general election to Clement Attlee. Because of this, Attlee replaced Churchill during the Potsdam Conference as the British representative. Once the declaration was signed, it was decided that America would solely oversee postwar Japan. Besides signing the declaration and promising to aid America during the war with a northern front, USSR was completely out altogether.
[190] United States GHQ and SCAP Occupational Administration, *United States Initial Post-Surrender Policy for Japan*, (Washington D.C., United States Government, September 6, 1945), https://www.ndl.go.jp/constitution/e/shiryo/01/022/022_003r.html.
[191] Refer back to the introduction for what a zaibatsu is. For further clarification view Kozo Yamamura, "Zaibatsu, Prewar and Zaibatsu, Postwar," *The Journal of Asian Studies* 23, no. 4 (1964): 539-554.

Japan under progressive reforms. These liberal reforms consisted of American New Dealer reformists, Charles Kades, Thomas Bisson, Eleanor Hadley, James Henderson, and Edward Welsh, who advocated dismantling of the zaibatsu.[192] These men wanted to reshape Japan under similar New Deal economic changes.[193] Because of their democratic ideologies they saw the harm in zaibatsu as they inhibited reshaping a new economy. From their perspective, the zaibatsu economic concept was a key reason behind Japan's wartime collusion economy, establishing Japan's aggressive military nature in the Fifteen Year War.[194]

The four main Japanese zaibatsu companies were Sumitomo, Mitsui, Yasuda, and Mitsubishi.[195] These companies were Japan's prewar economic titans, accounting for twenty-five percent of all of Japan's economic capital in 1937 and almost fifty percent in 1945, prior to the Japanese surrender.[196] Mitsubishi controlled twenty-eight subsidiaries and had 153 affiliations. All these subsidiaries and affiliations were fundamental in establishing a thriving economy in wartime Aichi Prefecture with the air works facilities.[197] The elimination of zaibatsu led to Mitsubishi's subsidiaries and affiliations either surviving on their own, restructuring under Allied

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[192] These men contributed and aided President F.D. Roosevelt under the New Deal administration and proposal. They wanted to carry over these similar utopian economic ideas in Japan to restructure their economy in a similar manner. However, this eventually leads to mass problems such as country-wide starvation, an economic depression, and the establishment of the reverse course.

[193] Because MacArthur was affiliated with the Republican party it is often assumed, he did not accept these progressive reforms. However, that was not the case. Takemae Eiji makes this important point to understand. He had to go against his own judgement and push the innate superiority of American values and civilization over the Japanese. MacArthur was able to deal with people of incredibly different political persuasions. Going against his racialist impulses and political ideologies is what made MacArthur remarkable in reshaping postwar Japan into a potential "utopia." Pages five through seven of Eiji's *The Allied Occupation of Japan* show how MacArthur handled these new reforms.

[194] Eiji, *The Allied Occupation of Japan*, 334-335.

[195] These were the main four zaibatsu companies, but other second tier ones included Asano, Furukawa, Ayukawa (Nissan), Okura, Nomura and Nakajima. These smaller zaibatsu are often referred to as "new zaibatsu." These companies also fell under the Allied's attempt to dismantle zaibatsu.

[196] John Dower, *Embracing Defeat: Japan in the Wake of World War II* (New York City: W.W. Norton & Company, 1999), 530 and Eiji, *The Allied Occupation of Japan,* 334. The "new zaibatsu" companies also contributed to the fifty percent of Japan's economic capital in 1945.

[197] Kozo Yamamura, "Zaibatsu, Prewar and Zaibatsu, Postwar," *The Journal of Asian Studies* 23, no. 4 (1964): 541.

utopian planners' economic ideals, or fizzling out altogether, which occurred most often for the smaller zaibatsu companies and affiliations. Between the Pacific War bombings and the dissolution of the zaibatsu, Mitsubishi Air Works in Nagoya declined as Aichi's top economic power postwar. These two factors were not alone in contributing to Mitsubishi Air Works' demise as another micro-principle played a significant role in the dissolution of Mitsubishi Heavy Industries.

The second micro-principle that Allied powers set to achieve was the dismantling of Japan's military. Located in part III of the policy was the plan to disarm and demilitarize Japan. It became the military occupation's primary goal to see that Japan no longer had a navy, army, air force, secret police, or any civil aviation.[198] The elimination of the military contributed to the demise of Mitsubishi Air Works in Nagoya. Once the war culminated in 1945, Mitsubishi's workforce plummeted from 360,848 to 91,425 in 1946. Only three years later, employee numbers declined to the lowest total in twelve years at slightly above 50,000.[199] With the dismantling of the entire Japanese military by the American occupation, Mitsubishi ceased to continue its postwar aircraft production. The elimination, physically and economically, of Nagoya's top economic producer, left the city grasping for a postwar reconstruction plan.

By 1946, the city legislature drafted a plan to be implemented instantly. Nagoya was in dire need of housing as over half the residential properties were destroyed from the bombings. This led to many citizens living in 'slum-like' areas, or in no shelter at all. In late 1945, a total of

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[198] United States GHQ and SCAP Occupational Administration, *United States Initial Post-Surrender Policy for Japan: Part III--Political*, (Washington D.C., United States Government, September 6, 1945), https://www.ndl.go.jp/constitution/e/shiryo/01/022/022_003r.html.

[199] **三菱重工業** (Mitsubishi Heavy Industries), **三菱重工業株式会社**史 (History of Mitsubishi Heavy Industries Stock Company) (東京, 來京®千代丸 [Tokyo, Kikyo Chiyomaru]: 三菱重工業株式会社 [Mitsubishi Heavy Industries Stock Association], 1956), 192.

3,000 fabricated shelters were sent to Nagoya until new permanent shelters could be built.[200] While housing was an issue in the reconstruction of Nagoya, it was not top priority. In late 1945, city officials drafted a reconstruction plan. The plan outlined the construction of two 100-meter-wide roads that ran through the heart of the city. These two roads were Hisaya Odori and Wakamiya Odori.[201] These two roads connected in an upside-down 'T' shape in central Nagoya.[202] In addition to these two roads, nine 50-meter-wide roads were planned to be constructed as well. These nine roads ran in every direction connecting east to west and north to south. They reached as far as the Nagoya Castle area and as low as Ise Bay, where the wartime location of Aichi Air Works stood.[203] The Nagoya City Public Works Bureau's objective was to emphasize 'urbanization' and 'urban-planning.' City planners were basing their projections on a population of two million, which was not reached until 1969.[204]

The Nagoya reconstruction plan was drafted in late 1945, but not approved until March 1946. Once approved, Nagoya set a path to bounce back postwar and begin the construction of the 100-meter and 50-meter-wide roads. In August 1946, Nagoya held a 'reconstruction festival' to reveal the plans to the public, which became known as the *Nagoya Reconstruction City Planning Land Readjustment Project*. The following October, Emperor Hirohito visited Nagoya to see the reconstitution plan's schematics and to inspect them. The reconstruction plans did have

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[200] Simon Gunn and Susan C. Townsend, *Automobility and the City in Twentieth-Century Britain and Japan* (London: Bloomsbury Academy, 2019), 29-35.

[201] 久屋大通 (Hisaya Odori) and 若宮大通 (Wakamiya Odori) are still in Nagoya.

[202] Nagoya City Public Works Bureau, 名古屋市復興計画1946年 (Reconstruction Plan of Nagoya 1946: After the War Damage) [map], Scale: unknown, Nagoya: Nagoya City Public Works, 1991.

[203] Nagoya City Public Works Bureau, 名古屋市復興計画1946年 (Reconstruction Plan of Nagoya 1946: After the War Damage) [map], Scale: unknown, Nagoya: Nagoya City Public Works, 1991.

[204] Gunn and Townsend, *Automobility and the City in Twentieth-Century Britain and Japan,* 29-35 and "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed February 13, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html.

a few hiccups before construction broke ground. In the path of the Hisaya Odori stood the Nagoya prison. Tearing down and relocating the prison posed a problem but was not the primary issue at hand. The main concern was the 279 cemeteries that contained 188,000 graves on the proposed construction sites. The plan was to relocate these graves to the eastern portion of Nagoya and establish a new peace park in their honor. This led to the local and Japanese government questioning the construction of the massive road.[205] These issues did pose a concern to the city planners, but they continued with the construction of these roads, regardless.

The roads were to become symbolic to Nagoya and symbolize that the city was beginning to recover. The construction of large roads highlighted the importance of urban planning and development. Once the roads were established, city planners began focusing on the reconstruction of housing. The Nagoya Reconstruction plan was set to rebuild Nagoya through urbanization in a thirty-five-year span. Focusing on the reconstruction of roads first, construction crews, city planners, and urban developers had access to move around the city in a more mobile manner to gauge the next course of reconstruction. By end of 1947, the construction of both Hisaya Odori and Wakamiya Odori was completed.[206] This opened the path for the prefecture's new top industry, which established the roots for Nagoya to become Japan's automotive hub moving forward.

Luckily for Aichi Prefecture, Toyota Automotive's Koromo plant remained unscathed from the wartime bombings. The entirety of the city of Koromo was contained in a densely wooded area. There were Allied wartime plans to bomb the city and Toyota production facility,

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[205] Gunn and Townsend, *Automobility and the City in Twentieth-Century Britain and Japan*, 29-35.
[206] Shishu, *Southern Nagoya*, [map], Scale: 1:25,000, City unknown: Shishu, 1947, accessed February 14, 2021, http://ktgis.net/kjmapw/kjmapw.html?lat=35.166034&lng=136.902948&zoom=15&dataset=chukyo&age=4&screen=2&scr1tile=k_cj4&scr2tile=k_cj4&scr3tile=k_cj4&scr4tile=k_cj4&mapOpacity=10&overGSItile=no&altitudeOpacity=2.

but the Japanese surrender came first, resulting in the city remaining unharmed. The Toyota production site was in the southeastern portion of the city. The production area contained a forge, foundry, engine plant, press shop, and the final assembly factory. The only other significant site in Koromo was a minor Aichi Air Works facility and airport in the northern portion of the city.[207] Besides these two production sites, the city contained small rivers and a vast amount of scrubland, without any economic value. The sparing of the Toyota production site became significant for Aichi moving forward in the postwar. While zaibatsu companies were being dismantled and the Allied Occupation focused on rearranging the economy, Toyota had the chance to take over as the prefecture's top economic business. In the initial postwar years, the wartime bombings, elimination of the zaibatsu, and removal of the Japanese military crushed Mitsubishi in every facet. Considering that Toyota's main production plant survived the Pacific War intact and was not a zaibatsu the company had momentum to build off and bring Nagoya and Aichi Prefecture out of the wartime ashes.

Toyota did face extinction because of the deteriorating Japanese economy. The Japanese economy was at the bottom of an abyss in the immediate postwar years. Toyota felt the repercussions of the economic decline as citizens were more concerned with obtaining food than new vehicles. Kiichiro Toyoda, president of the company, made a statement to all his employees that summed up the effects of postwar Japan: "The company will be going through some hard times in the days and months ahead. We may not be able to pay your salaries. Your future here is uncertain, so I urge you to reconsider it."[208] Leaving the decision to the employees to remain or seek different employment was a gamble, but one that did not impact the company initially.

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[207] The United States Army Map Service Chief of Engineers, *Koromo, Aichi-Ken, Honshu, Japan* [map], Scale: 1:12,500, Washington D.C., The United States Army, 1945.
[208] Toyota Motor Corporation, *Toyota: A History of the First 50 years* (Toyota City, Aichi Prefecture, Japan: Dai Nippon Printing Co., Ltd., 1988), 94.

Kiichiro's statement demonstrates the severity of postwar Japan, through a company that was still afloat and trying to produce a product. However, General Headquarters (GHQ) allowed Toyota to produce trucks, but only for reconstruction purposes.[209] The newly allocated production of trucks signified the prosperous future between Toyota and American occupation in the future.

The production of trucks for the postwar reconstruction provided some income for the prefecture, and maintained the company's production. Automotive companies were restricted from producing commercial vehicles as Toyota had prewar. GHQ wanted to limit commercial purchases and production until economic reforms were established.[210] A couple of months after Kiichiro's statement to his employees, employment started to decrease. Employee numbers fell from mid-September's total of 9,600 to 3,700 by the end of October. Food supply continuously worsened in the early postwar years, resulting in his employees having to quit in order to seek food. Kiichiro did establish a flour mill, bakery, charcoal plant, and a section of crops on the Koromo facility grounds.[211] The employees that remained were tasked with producing trucks for the reconstruction and bringing Toyota back to its prewar economic levels.

As Nagoya focused on the 1946 reconstruction plan and Toyota tried to keep employee morale and production alive, GHQ and SCAP Gen. MacArthur began the drafting of a Japanese constitution. When MacArthur became the SCAP, he had supreme authority to enforce any orders decreed and to carry out the initial surrender policies from the Potsdam Conference.[212]

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[209] Yukiyasu Togo and William Wartman, *Against All Odds: The Story of the Toyota Motor Corporation and the Family That Created It* (New York: St Martin's Press, 1993), 87. GHQ was the main location for MacArthur (SCAP) and American Occupational leaders.
[210] Togo and Wartman, *Against All Odds*, 87-88.
[211] Toyota Motor Corporation, *Toyota: A History of the First 50 years*, 95.
[212] Joint Chiefs of Staff, *Memorandum of the President, Subject: Authority of the Supreme Commander of Allied Powers*, (Washington D.C., United States Government, September 13, 1945) https://www.ndl.go.jp/constitution/e/shiryo/01/023/023_002r.html.

This allowed him to reshape Japan, through the guidance of the American New Dealers' political and economic ideologies.[213] By November 1946, GHQ and MacArthur had drafted a constitution for Japan. It contained the same New Dealer economic, political, and social ideals that the initial US Surrender Policy had. The Japanese constitution went into effect in May 1947. The articles contained within it had massive implications that spread throughout Japan in every aspect, including Aichi Prefecture.

The Japanese constitution contained eleven chapters that focused on the emperor, renunciation of war, rights and duties of the people, the Diet, the cabinet, judiciary actions, finance, local self-government, amendments, supreme law, and supplementary revisions.[214] Contained through the eleven chapters were 103 different articles that shaped Japan in the future. Several articles were important throughout all of Japan, such as the emperor being reduced to a symbolic position and everyone being equal under the law, but the articles focused on war and finance had a heavy impact on Aichi. Article 9, under Chapter II, is the complete and forever abandonment of all Japanese military. This was pushed through the 1945 US Initial Surrender Policy but became official once the constitution came into effect. Land, sea, and air forces were to *never* be maintained under Article 9 of the constitution.[215] The military was viewed as internationally threatening from the American perspective.[216] The official removal of the military

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[213] To clarify, MacArthur was not a New Dealer, per se, but was able to cooperate with the New Dealers' and listened to their democratic proposals. MacArthur had final say in what was sent to the Japanese government for implementation. However, a lot of the New Dealer's reforms—dissolution of the zaibatsu, eliminating the military, no commercial production—all contributed to reshaping Japan into a "utopian" society. If Japan became reshaped this way, then they would never again be a global menace. This was the overall objective in rebuilding Japan postwar. While MacArthur may not have necessarily agreed with the political ideologies of the Democratic New Dealers', he did agree these were the best reforms in reshaping Japan postwar.

[214] Members of SCAP and the Japanese emperor's cabinet, *The Constitution of Japan: Chapters 1-11,* (Tokyo: SCAP, 1947), https://japan.kantei.go.jp/constitution_and_government_of_japan/constitution_e.html.

[215] Members of SCAP and the Japanese emperor's cabinet, *The Constitution of Japan: Chapter 2-Article 9,* (Tokyo: SCAP, 1947), https://japan.kantei.go.jp/constitution_and_government_of_japan/constitution_e.html.

[216] Eventually American changes the outlook on the Japanese military. SCAP allows the military to transform into a self-defense force, prohibiting any offensive nature to it. Because of the rise in Communism in surrounding East

had a consequence for Mitsubishi moving forward. The production of Japanese military aircraft through Mitsubishi was to never occur again. The product that Mitsubishi widely produced in Nagoya was eliminated once the constitution came into effect. This left the company to try to produce a new product in the postwar years, once they became reestablished after the zaibatsu dissolution.

Through the constitution, the Diet became in charge of national finances. All people had the right and obligation to work. Employees were entitled to wages, hours, rest, and additional working conditions, but these were determined at the local level and in compliance with the company.[217] The idea was to entice citizens to seek employment, which would bring back the Japanese economy. The Japanese constitution mirrored American ideals and laws, establishing a new "utopian" democratic nation in East Asia.[218] The main problem, once the constitution came into effect, was the state of the economy and the impact on the people in 1947. Nagoya's economy and employment rate were concerning. In late 1947, the unemployment rate was roughly eleven percent higher than the employment rate.[219] The city began to feel the aftermath of GHQ's economic policies to remove the zaibatsu and the decline of Mitsubishi Heavy

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Asian countries, America feared the spread of Communism to Japan. This fear led to the creation of a Japanese self-defense force, in case a need the fight against Communism across the Japanese archipelago developed.

[217] Members of SCAP and the Japanese Emperor's Cabinet, *The Constitution of Japan: Chapters 3-Articles 27-28 and Chapter 8-Article 83,* (Tokyo: SCAP, 1947), https://japan.kantei.go.jp/constitution_and_government_of_japan/constitution_e.html.

[218] The word "utopian" is used here in the sense that America tried to shape Japan into a "perfect" society based upon America values. As the 20th century progressed it becomes clear Japan is far from a utopia; just as America was. However, Japan resembles more of a utopia than America ever has. Again, the goal is to make sure Japan never became a global menace again. Transforming them to resemble America, the "perfect" global society was the only way to do this.

[219] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed February 15, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html. In terms of precise unemployment numbers, there were 1,071,310 citizens unemployed compared to the 994,590 citizens employed.

Industries. The Allied Occupation had to quickly fix the state of the Japanese economy, in order to see success with the new constitution.

The weak Japanese economy and the growing concern regarding Communism forced GHQ to alter previous postwar policies resulting in the 'reverse course.' The Cold War era influenced American occupational leaders to abandon previous demilitarization and democratization reforms that were implemented from 1945-1947. War crimes for prominent figures were dropped, economic production was allowed to return for commercial products, and capitalists and state bureaucrats retook control of the economy. America's focus shifted from rebuilding Japan through American ideals to Communist containment on the Asian continent.[220] The biggest economic policy that impacted Nagoya was the reversal on zaibatsu companies. The entire dissolution of zaibatsu never occurred once occupational leaders decided to reverse course on their postwar policies. This led to the establishment of keiretsu, in place of the former zaibatsu companies.

The term keiretsu is a set of companies that interlock with one another through business relationships, banks, and shareholders that focus on the company's ownership and economic function.[221] It is similar to a zaibatsu but better applied to Japan's postwar economic setting. Keiretsu companies came from three classifications: 1) traditional keiretsu that came from old zaibatsu companies, 2) financial keiretsu that centered around banks, 3) industrial keiretsu that formed from the biggest production corporations.[222] Keiretsu companies were also categorized in

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[220] Dower, *Embracing Defeat*, 525-526.
[221] Jerzy Grabowiecki, *Keiretsu Groups: Their Role in the Japanese Economy and a Reference Point (or a paradigm) for Other Countries* (Wakaba, Chiba-Shi, Japan: Institute of Developing Economies, Japan External Trade Organization, 2006), 21.
[222] Grabowiecki, *Keiretsu Groups*, 22. There are three classifications of keiretsu: traditional, financial, and industrial. Traditional consist of the 'old' zaibatsu companies such as Mitsubishi. Financial keiretsu are centered around banks. Industrial is where Toyota falls in, which is centered around the biggest production corporations.

either horizontal keiretsu or vertical keiretsu. Horizontal keiretsu centered around a large city bank, that had smaller companies underneath the main company in nearly every industrial sector. Horizontal keiretsu mirrored zaibatsu and contained the old zaibatsu companies, such as Mitsubishi and Mitsui. Vertical keiretsu operate within the industry, loosely stating, and linked suppliers, distributors, and manufacturers together under one company.[223] Vertical keiretsu were companies that did not previously fall under the zaibatsu structure, such as Toyota. The establishment of the keiretsu structure was a way to rebuild Japan's economy. This opened the way for Toyota to begin production of commercial vehicles, in addition to trucks for reconstruction purposes. Mitsubishi began vehicle production too, as they were no longer allowed to produce military aircraft.

Nagoya's population began to trend upward once the keiretsu structure was put into place. The 1945 population was at 597,941, which was a twenty-five-year low. Once the keiretsu structure came into place in 1947, Nagoya's population rose to 915,725.[224] With near one million population, Nagoya was beginning to recover in the postwar period and had an ample number of citizens to begin work at the new keiretsu companies of Mitsubishi and nearby Toyota in Koromo. At this same time, Kiichiro Toyoda developed plans to begin producing his dream product, a small passenger car. GHQ ended its suspension on commercial car production in mid-1947. A total of 300 passenger cars with engine sizes up to 1500cc were allowed to be produced

[223] Grabowiecki, *Keiretsu Groups*, 23, and J. McGuire and S. Dow, "The Persistence and Implications of Japanese Keiretsu Organization," *Journal of International Business Studies* 34, no. 4 (2003): 376-377, and David Flath, "Shareholding in the Keiretsu, Japan's Financial Groups," *The Review of Economics and Statistics* 75, no. 2 (1993): 251-252.

[224] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed February 15, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html.

per year.[225] He saw this vehicle as a proper commercial vehicle for Japan compared to America's larger cars. Kiichiro knew smaller cars contained several problems: low horsepower, cramped interiors, excessive weight, and unnecessary vibration.[226] He wanted to eliminate these issues and produce a car that had the same utility as a larger America-style vehicle. By mid-1947, Toyota engineers had built their first small car prototype. The company had successfully produced the two-door Model SA passenger car. The car was to be catered to individual drivers due to its smaller size. In September, Toyota decided to call these smaller cars 'Toyopet' and launched them the following October.[227] The success of Toyota launching the first commercial vehicle in the postwar era, proved that Aichi was recovering exceptionally well from the Pacific War aftermath.

As Toyota began to produce commercial cars for the first time in the postwar period, Japan's economy began to take a turn for the worse. In 1949, the Allied occupation focused on stabilizing Japan's economy, but was wary of the growing Communist threat, or 'red scare.' As Communist tensions continued to build, GHQ implemented a plan to fix Japan's economic woes. Joseph Dodge, an American economic architect, was placed in charge of this plan, the Dodge Line. Under the Dodge Line, nine principles—referred to as 'Nine Commandments'—were put in place to curb inflation. He thought the Japanese economy was beginning to overheat, and wanted to limit the money supply, which would curb inflation. Dodge worked alongside MacArthur and became known as the 'Imperialist Accountant,' as he laid out his plan to fix Japan's continuous economic problems. The Dodge Line called for 1) loans to be shut off, 2)

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[225] Thomas French, *The Economic and Business History of Occupied Japan*, ed. Thomas French (New York City: Routledge, 2018), 102.
[226] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 101.
[227] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 101-102 and Togo and Wartman, *Against All Odds*, 96-98.

government subsidiaries were to be curbed, and 3) the cabinet and parliament were forced to adopt an overbalance budget that showed a surplus. These new reforms also led to a merge between the Ministry of Commerce and Industry and the Board of Trade, which created the Ministry of International Trade and Industry (MITI).[228] The primary goal of MITI was to control international trade policy.[229] Dodge's plan did halt inflation in 1949, but it came with a slew of problems that highly impacted Toyota.

Dodge's reforms put Japan into an economic recession and created labor issues. As vehicle sales started to ramp up, the new economic reforms caused sales to decline significantly. To afford cars, customers often purchased them through a line of credit. Many of these customers became unable to afford repayments because of Japan's economic state.[230] Internally in Toyota, massive shake-ups occurred. The company was unable to pay employee wages. This resulted in strikes, stoppages, and unrest from the employees and shareholders of the company. Nearly 2,000 employees were laid off in the process, but the biggest change was President Kiichiro Toyoda's resignation.[231] Kiichiro's resignation resulted in Taizo Ishida taking over as Toyota's president.[232] As the company experience widespread changes, the next course of action became unclear. The Korean War's outbreak became the answer that the company was looking for.

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[228] Dower, *Embracing Defeat*, 540-542.
[229] John Pike, "Ministry of International Trade and Industry," Federation of American Scientists, revised September 12, 2003, https://fas.org/irp/world/japan/miti.htm#:~:text=Historical%20Background%3A%20Japan's%20Ministry%20of,restoration%20of%20industrial%20productivity%20and.
[230] The higher interest rates from the lines of credit also contributed to customers unable to make repayments.
[231] French, *The Economic and Business History of Occupied Japan*, 105.
[232] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 110. Taizo Ishida was president of Toyoda Automatic Loom Works previously and helped to rebuild the company postwar. He was known for his impeccable managerial abilities, which is a main reason he replaced Kiichiro of Toyota Motor Company. He accepted the president position with intention that Kiichiro would reclaim the position once business recovered.

The growing threat of Communism took shape in June 1950, as North Korean forces crossed the 38th parallel into South Korea. President Harry Truman never asked Congress to declare war against North Korea. However, he sent military forces to the Korean Peninsula to act as an international peace-keeping force that was commanded by the United Nations and Gen. Douglas MacArthur. The Korean War outbreak reshaped Japan, yet again, and nearly overnight. SCAP leaders, including MacArthur, shifted their attention to the Korean conflict. The oversight of postwar Japan became secondary to the containment of Communism on the Korean Peninsula. Allied Occupation began to change Japan's policy once more, to benefit the American military fighting in the Korean War. Occupational leaders decided to reverse the policy on Japan not producing military arms. The reasoning for the reversal was to have a quicker supply of military necessities exported from Japan rather than America. This began an economic rise in the country. Orders ranged from non-weapon items such as coal, textiles, electronics, and scrap metal to military equipment such as trucks, GI housing, ship and aircraft repair facilities, and heavy transport. Prime Minister Yoshida declared the Korean War, 'a gift of the gods.'[233] The main producer of Japanese wartime trucks for America came from Toyota's Automotive facility in Aichi.

The Korean War orders placed massive pressure on Toyota's facilities. The factories struggled to keep up with the large number of trucks demanded. At the start of the war, Toyota produced 340 vehicles per month. By August, the orders increased to 1,000 vehicles per month, and by March 1951 had reached 1,542 vehicles per month.[234] The production numbers increased,

[233] Eiji, *The Allied Occupation of Japan*, 485.
[234] At the time, Toyota was producing both cars and trucks. They wanted to continue the production of commercial vehicles, but also fulfill the Korean War demands of producing the BM trucks. However, statistics on how many cars compared to trucks produced during the Korean War is difficult to locate in English sources.

but the workforce remained the same. [235] This was different compared to wartime Mitsubishi that constantly increased employee numbers to keep up with the aircraft demand. Toyota kept the same amount employees and required them to work a minimum of two hours of overtime per day to fulfill the truck demand.[236] One of the engineer leaders, Taichi Ohno, was put in charge of managing the on-floor production and the employees' way of mass production. Ohno required each worker to operate three to four machines arranged in a horseshoe pattern based upon the production process order, rather than by machinery type.[237] The objective was to speed up the production process and stay on pace with the high demand. Before the war, in March 1950, the company recorded losses of 76.5 million yen. The high American demand for Toyota's trucks saved the company from near collapse as those losses turned into a 249.3-million-yen profit by March 1951. Once the last order came that same March, the company had produced 4,679 BM model trucks for America by the war's end.[238] The mass American orders brought Toyota to new production levels and saved Aichi's economy in the process. These orders paved the way for Aichi cities to further rebuild in the postwar, establish a successful production process, and enticed other keiretsu companies to attempt vehicle production post-Korean War.

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[235] Fujita Kuniko, "Corporatism and the Corporate Welfare Program: Impact of the Korean War on the Toyota Motor Corporation," in *The Occupation of Japan: The Impact of the Korean War*, ed. William F. Nimmo (Norfolk, VA: General Douglas MacArthur Foundation, 1986), 116-117.

[236] Toyota Motor Company, "Item 2 Occurrence of special demand due to the Korean War," Equipment Modernization, Toyota Motor Company, accessed February 16, 2021, https://www.toyota.co.jp/jpn/company/history/75years/text/taking_on_the_automotive_business/chapter2/section7/item2.html.

[237] Fujita Kuniko, "Corporatism and the Corporate Welfare Program: Impact of the Korean War on the Toyota Motor Corporation," in *The Occupation of Japan: The Impact of the Korean War*, ed. William F. Nimmo (Norfolk, VA: General Douglas MacArthur Foundation, 1986), 117.

[238] Toyota Motor Company, "Item 2 Occurrence of special demand due to the Korean War," Equipment Modernization, Toyota Motor Company, accessed February 16, 2021, https://www.toyota.co.jp/jpn/company/history/75years/text/taking_on_the_automotive_business/chapter2/section7/item2.html, and Toyota Motor Corporation, *Toyota A History of the First 50 years*, 111.

As the Korean War was ending, Mitsubishi started the production of its first vehicle, their version of a Willys Jeep. During the Allied Occupation, Willys Jeeps became popular in Japan as it was the vehicle of choice for American occupiers. The outbreak of the Korean War created a demand for trucks, primarily supplied by Toyota, and the continuation of Willys Jeeps. As SCAP and Allied forces, previously occupying Japan, became distracted with the Korean War, protecting Japan internally from Communism became a worrisome thought. For reassurance, the Japanese National Police Reserve (NPR) was established to halt any Communist threats. The NPR preferred the Willys Jeeps as the ideal patrol vehicle. With the majority of Jeeps being monopolized by the Korean War, a void was created that the NPR wanted to resolve by obtaining new Jeep-style vehicles with a Japanese influence. To fill this void, a three-company competition occurred between Nissan, Toyota, and Mitsubishi to produce the new Japanese version of the Willys Jeep.[239]

Nissan proposed the 'Nissan Patrol,' a compact version of the Willys Jeep. Toyota proposed the 'BJ' or 'B-engine Jeep,' a six-cylinder, four-ton gasoline vehicle using the frame of an SB-type truck they produced. Mitsubishi had already been producing a Japanese version of the Willys Jeep using imported Willys Jeep parts and submitted the original design without any changes. Toyota's Jeep performed better in trial tests, but the NPR decided to adopt the Mitsubishi-Willys Jeep as their standard patrol vehicle because of production experience,.[240] Mitsubishi received a contract to produce 500 Willys-style Jeeps by the end of the Korean War. The company regrew as a keiretsu that highly focused on vehicle production. Mitsubishi adhered

[239] French, *The Economic and Business History of Occupied Japan*, 107-108. There are similarities in the competition to produce the Japanese Willys Jeep and the Japanese wartime fighter (refer to chapter two for this). These competitions produce multiple versions of the same product, which gives the Japanese different options to select from. Once the competition is over, it allows the competing companies to collab together and share mechanical components with each other (as seen with Nakajima and Mitsubishi during the Pacific War).
[240] French, *The Economic and Business History of Occupied Japan*, 108-109.

to the same production quality that they had during wartime while producing aircraft. Between Toyota and Mitsubishi, Nagoya had a chance to prosper during the postwar reconstruction. This gave new life to a city that was left nearly forty percent destroyed only eight years before.

Nagoya in the post-Korean War years saw rapid expansion in the city's infrastructure and population. This stems largely from the Korean War's, 'Second-Economic Miracle,' boom that occurred because it led to large-scale industrial output across Aichi, as proved by Toyota and Mitsubishi. Japan's industrial output rose by fifty percent because of the Korean War. Average yearly wages for Toyota workers increased two and a half times from the start of the war to its culmination.[241] These were enticing motives to relocate or remain in Aichi, permanently. By 1954, the population eclipsed the highest number of citizens to date, with over 1.2 million residing in Nagoya.[242] The postwar period saw Nagoya begin to turn the corner as Japan's automotive hub. Toyota was preparing a plan to produce vehicles in a more modernized process that catered to the city's growing urbanization and the demand that Japanese citizens sought for in a vehicle. The Korean War brought Aichi's top automotive company to new production levels and saved them in the process. The Toyota management was ready to produce and capitalize on the success of commercial vehicles in the mid-1950s.

Taichi Ohno had produced the 'just-in-time' production system during the Korean war.[243] This system became the postwar production method when producing commercial vehicles. The

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[241] Roger Dingman, "The Gift and the Dagger: The Impact of the Korean War on Japan," *The Journal of American-East Asian Relations* 2 no. 1 (1993): 42.

[242] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-12 Employment and Unemployment Population (Taisho 9 to Showa 60), data visualization by Nagoya City Hall, accessed February 16, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html.

[243] Togo and Wartman, *Against All Odds*, 79, 115-118. Kiichiro Toyoda started the 'just-in-time' concept but knew it would take years to perfect. The idea was to produce components of a vehicles only when needed and not beforehand. They should be made, "just-in-time." Taichi Ohno furthered this during the Korean War, as he saw if more efficient to have the automobiles pull component parts to them, rather than push them through the assembly line and creating a stockpile of parts. Ohno compared this system to American supermarkets and how they restocked

result led to the company mass-producing smaller cars, such as the early Toyopet, introduced before the Korean War, and selling them at competitive prices.[244] To do this, the company had to follow the concept that the MITI provided as the 'people's car' that Japanese citizens wanted to purchase. The car had to be compact and within an affordable price range. This led to Toyota producing two different commercial vehicles, the Crown and the Master. The Koromo plant in Aichi was the leading production site for both vehicles. The significant difference between a Toyota vehicle and other Japanese vehicles was that Toyota produced an entirely domestic car. Other Japanese companies had license agreements with overseas manufacturers when producing their vehicles. The creation of an entirely domestic car uplifted morale throughout the employees as they created Toyota's first "real" passenger cars.[245] On New Year's Day 1955, Toyota unveiled the completion of the first Toyota Crown. The car was built completely from scratch and resembled the sketches and ideas that Toyota's automotive founder Kiichiro Toyoda has envisioned in the 1930s. By the end of January, both the Toyota Crown and Toyota Master went into full-scale production. The result led to Toyota producing hundreds of both vehicle models per month to keep up with the public's demand.[246]

The triumph of the Toyota Crown and Toyota Master led to newfound success for the company. The Toyota Crown was the ideal car that the MITI projected under the concept and was 150,000 yen cheaper compared to Nissan's version, the Austin.[247] The economic success led

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shelves. He saw it as customers purchased only the products they needed, and the stores restocked only those shelves once customers had depleted them. The same principle applies in the 'just-in-time' system that Toyota was using to produce vehicles.

[244] Fujita Kuniko, "Corporatism and the Corporate Welfare Program: Impact of the Korean War on the Toyota Motor Corporation," in *The Occupation of Japan: The Impact of the Korean War*, ed. William F. Nimmo (Norfolk, VA: General Douglas MacArthur Foundation, 1986), 117.

[245] Togo and Wartman, *Against All Odds*, 133.

[246] Togo and Wartman, *Against All Odds*, 133-134 and Toyota Motor Corporation, *Toyota A History of the First 50 years*, 135.

[247] Togo and Wartman, *Against All Odds*, 134.

the company to create new dealer networks across Japan. These dealers were called Toyopet Dealers, and by early 1956 eight had already opened for business. Toyopet dealers were responsible for selling the Model SKB trucks and the new Toyota "Toyopet" Crown. The Toyota Master became the primary vehicle for taxi companies, rather than commercial sales. The high-volume of production forced the company to establish four new production measures to avoid any potential errors. The new measures focused on, 1) work improvement to eliminate any waste, 2) daily inspection of machines to ensure they function properly, 3) creation of product work slips, and 4) standardization based upon machine type. This method became known as the 'supermarket method' of production and allowed the company to build vehicles at a faster pace while ensuring everything produced was a quality product. [248] In 1955, the company produced 22,000 vehicles and jumped to 71,000 vehicles by 1957.[249] The success of the Toyota Crown, or 'Toyopet Crown' caught the eye of the American market. Aichi's top company was anxious to export their top product overseas and compete in the American market.

In 1950s America, families left growing urbanized cities and relocated into the suburbs. The demand for vehicles grew as families need them to travel to and from the city for their daily commute. American cars began to increase in price, and the price of European vehicles did not fare much better. Toyota's President of Sales, Shotaro Kamiya, worried about Toyota competing against American brands in the American market but wanted to try regardless. Two Toyopet Crowns were sent as the sample cars to the United States. However, the Crown quickly failed because of its small 1500cc engine that could not keep up on American highways and the high

[248] Toyota Motor Company, "Item 4 Supermarket Method," Equipment Modernization, Toyota Motor Company, accessed February 16, 2021, https://www.toyota.co.jp/jpn/company/history/75years/text/taking_on_the_automotive_business/chapter2/section7/item2.html.
[249] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 157.

oil and fuel consumption. Because of these issues the Crown experiment in America was over before it started. However, the silver lining from the Crown's trial run in the States led to Toyota opening its first overseas sales facility. On Halloween 1957, Toyota Motor Sales, U.S.A. was established, and capitalization was at one million USD.[250] A company that was on the brink of bankruptcy a decade prior had opened an overseas sales facility. At this point, Aichi Prefecture had become Japan's top automotive economic hub through Toyota's crowning achievements.

Toyota was not the only automotive company in the prefecture that had economic success during Japan's postwar period. Mitsubishi combined the three companies they formed in 1950, East Japan Heavy Industries, Central Japan Heavy Industries, and West Japan Heavy Industries, and founded Mitsubishi Heavy Industries, Ltd, in 1964 and opened Mitsubishi Motor Sales.[251] The company focused largely on Jeep production, but produced other vehicles such as the Mitsubishi 500 and Colt 1000 series.[252] Mitsubishi had success, but never at the level Toyota had in the 1950s-1960s. By 1960, Nagoya's population was well over 370,000 citizens. Of the 370,000, 50.2 percent were employed in some capacity.[253] The Korean War created a path for Aichi's postwar recovery. Once the Korean War ended, Japan's automotive economic success never turned back. Toyota grew exponentially within the decade, and Mitsubishi sought

[250] Togo and Wartman, *Against All Odds*, 142-144.
[251] Hampton Mitsubishi, "A History of Mitsubishi," Mitsubishi Motors, accessed February 17, 2021, https://www.hamptonmitsubishi.com/the-history-of-mitsubishi-in-lafayette-la/#:~:text=1950%3A%20Mitsubishi%20Heavy%20Industries%20splits,and%20West%20Japan%20Heavy%20Industries.
[252] Mitsubishi Motors, "The History of Mitsubishi Motors: Car History," Mitsubishi Motors, accessed February 17, 2021, https://www.mitsubishi-motors.com/en/company/history/car/.
[253] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-1 Year-to-year comparison of population (Meiji 22 to 1988), data visualization by Nagoya City Hall, accessed February 17, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html and "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-12 Employment and Unemployment Population (Taisho 9 to Showa 60), data visualization by Nagoya City Hall, accessed February 17, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html.

reestablishment through a new economic market in automotive sales, the market created by their nearby prefectural rival, Toyota Motor Company.

By 1960, Koromo, home to Toyota's main production facility, was renamed to Toyota City.[254] This change demonstrated that a prefecture, city, and multiple companies that experienced economic upheaval numerous times had come full circle from prewar accomplishments to wartime decimation, and then postwar success. An area reshaped based upon the economic principles that Allied Occupational leaders saw fit in the immediate postwar years, finally stabilized and climbed the economic ranks within Japan. The Pacific War bombings of Nagoya created a new path for the region. The bombings allowed the city to become urbanized and industrialized in the postwar years. The Allied Occupation provided hurdles and setbacks in the process, but the Korean War became the foundation for Aichi's economic postwar recovery. The bulk orders for Toyota wartime trucks led the way for Aichi's revenue to climb to previously unseen amounts. The success of Toyota led the way for old and new companies to join Aichi's automotive sales. By 1985, automobile sales accounted for 44.4 percent of Nagoya's exports. Toyota's headquarters remained within Toyota City, Suzuki Motor had a production factory in eastern Aichi, and Honda Motor had a production factory in western Aichi. Near the Nagoya port in Ise Bay was Aichi Machine Industry, a Nissan Motor's subsidiary facility, and Mitsubishi Motor's head production factory.[255] Forty years prior, these production sites focused on the rapid production of Aichi Type-99 and Mitsubishi Zero Fighters, respectively. Each factory wanted to build off Toyota's success and become Japan's next top automotive company. To do so, these

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[254] Toyota Motor Corporation, *Toyota A History of the First 50 years*, 146 and 朝日新聞社 (Asahi Shinbun[newspaper]) 東京 (Tokyo), 1951年3月1日 (March 1, 1951).
[255] Yasuo Miyakawa, "Nagoya: The Core of Japan's Global Manufacturing Industries," in *Japanese Cities in the World Economy*, Eds. Kuniko Fujita and Richard Child Hill, (Philadelphia: Temple University Press, 1993), 161.

production factories established themselves in Japan's automotive hub, Aichi Prefecture. Barring an unforeseen disaster, Nagoya and Aichi Prefecture's postwar reconstruction and economic market will continue to reach new levels of prosperity annually.

Conclusion:

The Reconstructive Catalyst

The cyclical process Nagoya experienced to modernization is oft-overlooked. Prewar, Nagoya rapidly developed into one of Japan's premier economic cities, only to be decimated during the Pacific War by American bombing raids. Postwar, the city swiftly recovered and became Japan's automotive hub, leading to an urbanized Nagoya. This cyclical process Nagoya went through closely parallels with the stages of a forest during a forest fire. As a fire scorched everything in sight, the forest is left bare and charred. In the immediacy, the forest seemed helpless and in a ruined state. Long term, the forest has a new chance to prosper from the destructive ablaze. New vegetation can grow, giving way to new life and new beginnings. Substitute 'Nagoya' for 'the forest' in each sentence, and the same effect occurs.[256] Nagoya was able to survive horrific disasters and recover to become a thriving economic hub for Japan. As the American B-29s ceased to reign fire on Nagoya, it left the city seeking a fresh start. City leaders wanted to rebuild Nagoya beyond pre-war levels, leading to the creation of the 1946 reconstruction plan. However, for a city to successfully rebuild post-disaster, there needs to be a reconstructive catalyst that serves as the basis for modernization. For Nagoya, Toyota served as the necessary reconstructive catalyst.

Chances of a successful reconstruction are slight without an economic lynchpin. Historical examples prove the limited value of reconstruction plans on their own.[257] Economic support beyond the reconstruction plan is needed for successful restoration. The wartime bombing and postwar dismantling of Mitsubishi's zaibatsu eliminated Nagoya's main economic producer. Toyota filled the void left by Mitsubishi, leading the company to become the new

[256] Refer to the introduction's first paragraph for the forest fire analogy.
[257] Refer to the 1666 London Fire section in the conclusion. Several reconstruction plans were proposed, but not were accepted. This led London to rebuild the city in a slower capacity than anticipated, and resulted in the city resembling the same infrastructure instead of modernizing.

economic lynchpin. Nagoya was successful in its reconstruction due to Toyota's economic success in the early 1950s, which served as the reconstructive catalyst.

Following the reconstruction plan's primary objective of rebuilding roadways, Toyota began producing and selling commercial vehicles.[258] Toyota's success created new jobs, which attracted population. The increased population and resulting urbanization contributed to a continuous rise in citizen income per year. By 1955, citizen income in Nagoya surpassed 4.3 million yen and rose annually.[259] The manufacturing industry accounted for the second-highest sector accounting for slightly over 1.5 million yen.[260] The jobs, rising population, and production of commercial vehicles reinvigorated Nagoya's postwar economy. Toyota was not the sole manufacturing company in Aichi in the mid-1950s but was the prefecture's largest keiretsu. Mitsubishi constituted as a keiretsu too, producing their new version of Willys Jeeps. However, they had only been in production for a few years. The company was still attempting to recover from the wartime bombings and corporate interference of the occupation.

Due to Mitsubishi's decline, Toyota became the primary company to contribute to the manufacturing industry's economic success. This economic success made Toyota the vital catalyst in the reconstruction process. The significance of this economic catalyst is the rationale for including Nagoya's restoration in historical scholarship. Nagoya took the reconstructive

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[258] The vehicles did not help establish these new roadways. That objective was entirely the city planners in Nagoya when planning a reconstruction plan. However, Toyota saw an economic opportunity and capitalized upon it with the creation of Nagoya's new roads. While Toyota was not selling to solely Nagoya citizens, it was the largest port city nearby and often where Toyota showcased new products.

[259] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-3 Number of households and population before transfer of municipalities transferred to Nagoya City (Taisho 9-Showa 35), data visualization by Nagoya City Hall, accessed March 12, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html.

[260] "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators," 1-2-2 Census population (Taisho 9-1985), data visualization by Nagoya City Hall, accessed March 12, 2021, http://www.city.nagoya.jp/somu/page/0000026159.html.

catalyst of Toyota and rebuilt the city into a new, modern, urbanized core. Rebuilding from any disaster(s), man-made or natural, requires a reconstructive catalyst. Considering disasters have occurred and will continue to occur, understanding Nagoya's postwar success is essential.

There are many historical precedents for failed recovery efforts due to the lack of an economic catalyst. The 1666 London Fire is no exception to this notion. In the seventeenth century, fire was a common disaster. There were little to no safety precautions in place to prevent a widespread fire. The infrastructure consisted of wood sealed by pitch, a highly flammable caulk that derives from petroleum.[261] In dry summers, such as 1666, these buildings were susceptible to quick conflagrations. The combination of the wood buildings coated in pitch, the dry summer, and minimal fire safety precautions combined all the ingredients for a massive disaster, which was precisely the outcome in 1666 London. Thomas Farynor's bakery on Pudding Lane ignited the inferno. The blaze continued from Sunday, September 2, to Thursday, September 9. Samuel Pepys recorded the fire daily in a diary on Tuesday, September 4:

> Only now and then walking into the garden, and saw how horridly the sky looks, all on a fire in the night, was enough to put us out of our wits; and, indeed, it was extremely dreadful, for it looks just as if it was us; and the whole heaven on fire. I after supper walked in the dark down to Tower Street, and there saw it on fire, at the Trinity House on that side, and the Dolphin Tavern on this side, which was very near us; and the fire with extraordinary vehemence.[262]

Pepys account of the horrors that set London ablaze is vivid. By the end of the week, 13,200 houses, 87 parishes, the Royal Exchange, and St. Paul's Cathedral were destroyed or damaged.[263] After the flames were extinguished, the objective was reconstruction.

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[261] London Fire Brigade, "The Great Fire of London," London Fire Brigade, accessed March 12, 2021, https://www.london-fire.gov.uk/museum/history-and-stories/the-great-fire-of-london/.
[262] Samuel Pepys, *Diary of Samuel Pepys*, September 1666, 4 September 1666, The Diary of Samuel Pepys: Daily Entries from the 17th century London diary, accessed March 12, 2021, https://www.pepysdiary.com/diary/1666/09/.
[263] London Fire Brigade, "The Great Fire of London," London Fire Brigade, accessed March 12, 2021, https://www.london-fire.gov.uk/museum/history-and-stories/the-great-fire-of-london/ and John Leake, *An Exact*

King Charles II encouraged proposals for reconstruction plans. The main problem with the plans that were proposed was they mirrored French infrastructure designs. These tentative plans presented an issue, as Britain did not want to resemble the French in any way, especially the reconstruction of their main city. A plan proposed by Christopher Wren differed from others. Nagoya's 1946 plan resembled Wren's plan in that it began with rebuilding and widening the streets. The plan would prevent another fire from easily spreading because of the natural fire breaks wide streets would provide. Wren's plan centered the city around the Royal Exchange, similar to Nagoya's plan to center the city around the Nagoya Castle. The wider roads would connect with other smaller roads interweaving throughout the city. The proposed addition incorporated several piazzas (e.g., town squares) to provide more open areas in the city. The Royal Exchange was home to many piazzas, but the main one was proposed for London's eastern section. The piazzas' openness provided citizens a place for daily strolls, entertainment, and to "get out" of the city's atmosphere. It also was designed to prevent another 1666 conflagration from happening again because of the distances between structures around the piazzas.[264]

Wren's plan provided a path for reconstruction; however, two issues prevented it from being carried out. The first was that King Charles II rejected the plan. The finances were not available to carry out Wren's detailed plan. The second issue came from the economy not supporting Wren's plan or London's reconstruction efforts. As seen with Nagoya, a thriving economic foundation as a reconstructive catalyst is required to establish successful post-disaster efforts. London had a reconstruction plan, but nothing

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Survey of the Streets Lanes and Churches Contained Within the Ravines of the City of London [map], Scale: of feet, London, Lord Mayor Alderman and Common Council of the Said City, 1666.

[264] Christopher Wren, *A Plan for Rebuilding the City After the Fire* [map], Scale: 1800 feet, London, Parliament, 1666.

to financially support it. With the city largely burnt, the local economy was crippled. Small scale shops, such as Farynor's bakery, contributed to London's seventeenth century economy. The burning of these small-scale shops destroyed the economy in the process. Comparing Nagoya's reconstructive efforts to seventeenth century London demonstrates Toyota's importance as a reconstructive catalyst. Having a reconstruction plan is only the first step; economically supporting the plan is the following step and the most crucial.

London failed to have the finances, while Nagoya did. London failed to rebuild quickly, and Nagoya rebuilt into a modernized city within ten years. London was on the cusp of rebuilding in the same fashion that Nagoya did nearly 300 years later. Eventually, London rebuilt but in small stages. Wren's influence was limited to the reconstruction of St. Paul's cathedral and several other smaller parishes. While London eventually recovered, it took nearly a century to do so. Not an ideal timeframe given a proposed plan had them recovering faster and into a more modernized seventeenth century city.

In contrast to London's seventeenth century reconstruction plan is Tokyo's twentieth century reconstruction plan after the 1923 Great Kanto Earthquake. As previously seen, the 1923 earthquake had a significant effect on America's Pacific War strategic bombing incendiary efforts against Japanese cities. However, the silver lining of the earthquake came post-disaster. Tokyo rebuilt successfully in a manner followed by Nagoya. The earthquake killed between 100,000 to 110,000 and left another 2.5 million homeless in Tokyo and Yokohama. Ninety percent of structures in Yokohama were destroyed, with forty-five percent destroyed in Tokyo. Estimated costs from the disaster were around 6.5 million yen, four times larger than Japan's entire national 1923

budget.[265] Due to the extreme economic damage, the reconstruction budget was scaled back and limited by Japan's government in proposed rebuilding plans.

Tokyo's reconstruction plan focused on two objectives in order to rebuild. The First was the establishment of new roadways. Establishing a few wide, 100-meter main roads that connect and smaller, 50-meter roads created a basis for renovation.[266] The second objective was acquiring the land to begin construction. The creation of the 1923 Special Urban Planning Law allowed the government to take ten percent of everyone's land without any monetary compensation in return. Because of the weak economy, government officials acquired land without large finances. These government actions led to 33 million squares acres of acquired land, divided into sixty-six land readjustment districts. The City of Tokyo oversaw fifty-one of these districts, and the Home Ministry managed the other fifteen.[267]

The acquired land provided a sizeable area for Japan's government to begin rebuilding the city. The initial budget for reconstruction began at several billion yen. However, the Japanese government wanted to reduce the budget but still successfully reconstruct. Eventually, the budget dropped from several billion yen to half a billion yen. The rebuilding of Tokyo included the creation of parks, schools, bridges, canals, and manufacturers. Most of these were to be built out of concrete and based upon European and American urban-style models.[268] Building sturdier buildings to withstand massive

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[265] J. Charles Schencking, "The Great Kanto Earthquake and the Culture of Catastrophe and Reconstruction in 1920s Japan," *The Journal of Japanese Studies* 24 no. 2 (2008): 296.
[266] The Great Kanto Earthquake, "Land Readjustment: Rebuilding Tokyo from the Ashes Up," The Great Kanto Earthquake.org, accessed March 13, 2021, http://www.greatkantoearthquake.com/reconstruction.html#contest.
[267] The Great Kanto Earthquake, "Land Readjustment: Rebuilding Tokyo from the Ashes Up," The Great Kanto Earthquake.org, accessed March 13, 2021, http://www.greatkantoearthquake.com/reconstruction.html#contest.
[268] Joshua Hammer, *Yokohama Burning: The Deadly 1923 Earthquake and Fire That Helped Forge the Path to World War II* (New York: Free Press, 2006), 250.

earthquakes of high magnitude became the priority. The Special Urban Planning Law and the government providing half a billion yen to fund it became the reconstructive catalyst needed to rebuild Tokyo post-disaster.

The rebuilding of Yokohama fell to a secondary priority in reconstruction efforts. Reserved finances for rebuilding Tokyo delayed any reconstruction efforts in Yokohama. Even basic clean-up efforts were delayed as all focus centered on Tokyo. Charred bodies from the widespread fires remained in the streets well into the winter as locals attempted to clean up Yokohama.[269] Yokohama did not recover in the same timeframe as Tokyo. By 1930, Tokyo announced it had fully recovered from the Great Kanto Earthquake while Yokohama continued to languish. Tokyo had a reconstructive catalyst in government finances backed by the acquired land and a reconstruction plan. This is an example for Nagoya's successful rebuilding process. Both cases had a reconstructive catalyst, that established economic funds and supported a well-designed reconstruction plan. These two Japanese examples are post-disaster reconstruction pinnacles of rebuilding a city. Both times the Japanese choose to view the disaster as a blessing rather than a curse. This perspective allowed them to recover and alter the city for the better. This is the main reason behind both cities being viewed domestically and internationally as prominent cities.

Nagoya mirrored the Great Kanto Earthquake in reconstruction. Both had a successful reconstructive catalyst, drawn-out rebuilding plan, and finances to support these proposed initiatives. However, these two twentieth century examples still need to be

[269] Hammer, *Yokohama Burning*, 251-252.

applied in the current century with reconstruction efforts. The twenty-first century has witnessed numerous natural and man-made disasters. Ranging from the 9/11 attacks in New York City, the 2004 Indian Ocean earthquake and subsequent tsunami, the 2010 Haiti earthquake, to the on-going COVID-19 pandemic. One disaster stands out, not only for the violent destruction it caused but also for the inadequate post-disaster reconstruction efforts.

In 2005, Hurricane Katrina struck New Orleans, Louisiana, causing a massive catastrophe. Peaking at a category three hurricane, with 145 mph winds, Katrina brought intense storm surge and flooding because of the failed levee system.[270] Between the high winds and extreme flooding, New Orleans was left in ruins. Death estimates vary but range from 1,300 to 1,850. While the death toll was relatively small, it still serves as an important example of urban development issues because of a lacking reconstructive catalyst. Katrina is still the costliest hurricane to date, with an estimated $160 billion in damages. Around eighty percent of the city was underwater in some capacity, resulting in 300,000 to 350,000 homes destroyed.[271] The destruction of Hurricane Katrina, physically and economically, left New Orleans questioning recovery efforts.

Rebuilding from the costliest hurricane to date is beyond a problematic measure. The hurricane affected three major portions of the city, eastern New Orleans, central New Orleans, and the Ninth Ward. The Ninth Ward yielded the most extreme destruction because of the failed levee systems. Standing water in the Ninth Ward measured depths

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[270] Louise K. Comfort, Thomas A. Birkland, Beverly A. Cigler, and Earthea Nance, "Retrospectives and Perspectives on Hurricane Katrina: Five Years and Counting," *Public Administration Review* 70 no. 5 (2010): 1.
[271] Kathryn Reid, "2005 Hurricane Katrina: Facts, FAQs, and how to help," WorldVision, revised November 25, 2019, https://www.worldvision.org/disaster-relief-news-stories/2005-hurricane-katrina-facts#:~:text=An%20interesting%20fact%20is%20that,as%202%2C400%20ships%20and%20vessels.

of ten to fifteen feet. This flooding forced residents to flee to their rooftops and await rescue.[272] After several weeks of search-and-rescue, clean-up efforts, and coping with the high losses, New Orleans started drafting reconstruction plans. An estimated eight to eleven years seemed to be the consensus timeframe needed to rebuild the city—an estimate far from reality.

The main problem in rebuilding New Orleans was the planning responsibility fell on the city, state, and federal governments, collectively. At the city and state levels, two planning processes were created that competed with one another. The city launched the Bring New Orleans Back Commission (BNOBC), and the state introduced the Louisiana Recovery Authority (LRA). These two reconstruction committees competed against one another with their proposed plans. The BNOBC wanted to focus on flood prevention, playgrounds, and parks in their proposed reconstruction plan. The LRA concentrated on a smaller New Orleans with a population of around 250,000. The smaller population would establish a safer and sustainable New Orleans. The federal-level, led by the U.S. Army Corps of Engineers and the Federal Emergency Management Agency, focused on rebuilding levees and flood prevention. Because of the conflicting agendas from all levels, a true reconstruction plan was never established.[273]

Local and state leaders envisioned a "new" New Orleans. A smaller city with brand new parks, playgrounds, schools, and walkways. The older neighborhoods, the Ninth Ward, would become restored to their historical roots. Funding for these

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[272] Dan Swenson, *Hurricane Katrina Flooding: 2005* [map], Scale: unknown, New Orleans, LA: The New Orleans Times-Picayune, 2019.
[273] R.W. Kates, C.E. Colten, S. Laska, and S.P. Leatherman, "Reconstruction of New Orleans After Hurricane Katrina: A Research Perspective," *Proceedings of the National Academy of Sciences of the United States of America* 103 no. 40 (2006): 14655.

expenditures were allocated from public and private funds. Likewise, a newer economy would be established that focused on New Orleans' previous economic strengths: tourism, culture, education, and ports.[274] This utopian vision for post-disaster New Orleans is fictional, at best, given the state of the city pre-disaster. The city's population and economy had declined since 1960. In 1960, New Orleans' population peaked at 625,000 citizens, but by July 2005, right before Katrina's landfall, the population had declined by thirty-one percent to 437,000. By December 2005, the population diminished to slightly over 154,000. [275] In 2006, 32,000 of the approximately 106,000 households were vacant, and of these original households two-thirds remained uninhabitable to some degree.[276] Thus, the housing market declined drastically, and the cost of living increased substantially. Little progress has been made to fixing the housing crisis. By 2007, the city of New Orleans issued 57,000 residential building permits since Katrina's landfall, but that only aided slightly over fifty percent of the households.[277]

The population and housing declines and the conflicting reconstruction plans have resulted in New Orleans still rebuilding sixteen years after Katrina's landfall. Not having an established reconstruction plan in place was only one factor. The lack of an economic mainstay as a reconstructive catalyst was the primary issue. New Orleans never had a top-tier economic business such as Toyota or massive government funds to fuel an

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[274] R.W. Kates, C.E. Colten, S. Laska, and S.P. Leatherman, "Reconstruction of New Orleans After Hurricane Katrina: A Research Perspective," *Proceedings of the National Academy of Sciences of the United States of America* 103 no. 40 (2006): 14656.
[275] R.W. Kates, C.E. Colten, S. Laska, and S.P. Leatherman, "Reconstruction of New Orleans After Hurricane Katrina: A Research Perspective," *Proceedings of the National Academy of Sciences of the United States of America* 103 no. 40 (2006): 14656-14658.
[276] Jacob Vigdor, "The Economic Aftermath of Hurricane Katrina," *Journal of Economic Perspectives* 22 no. 4 (2008): 146.
[277] Jacob Vigdor, "The Economic Aftermath of Hurricane Katrina," *Journal of Economic Perspectives* 22 no. 4 (2008): 147. This statistic is not counting any citizens who later post-disaster.

established reconstruction plan. The lack of both the reconstruction plan and the reconstructive catalyst has resulted in New Orleans still stagnant rebuilding processes. Hurricane Katrina's impact on New Orleans is an example of post-disaster negligence. It is easy to compare Nagoya's success to New Orleans' failure and see the requirements for properly rebuilding after a disaster. Hurricane Katrina's impact is still felt, and until a reconstructive catalyst is established, the rebuilding process will continue to drag on.

Fitting the Pacific War bombings of Nagoya into the historical scope of disasters, man-made and natural, is vital for reconstructive efforts. The 1666 London fire proved the weakness of obtaining a reconstruction plan without an economic catalyst to support it. In order to support the rebuilding of a city, it is necessary to have economic support. The 1923 Great Kanto Earthquake proved how important a reconstructive catalyst is. Acquiring ten percent of the land from Tokyo's citizens and using that as the basis for reconstruction, funded by the Japanese government banks, created a modernized Tokyo in only seven years. Eighty-two years later, New Orleans demonstrated the impact of having no established reconstruction plan or reconstructive catalyst. The city is still rebuilding nearly twenty years after the hurricane with no end in sight. These are historical examples of rebuilding post-disaster, but nothing compares to Nagoya's recovery. A city left on the brink of collapse because of Pacific War bombings and the dismantling of Mitsubishi, Nagoya had no way of recovering. Luckily, Toyota rose to become an economic power and became the city's reconstructive catalyst in reconstruction. Understanding Nagoya pre-war, wartime, and postwar is essential for many reasons. Because of Toyota, Nagoya blossomed into a modern, urbanized, economic hub for Japan centered on the automotive industry. Just as the cherry blossom

trees bloom every spring, Nagoya found a way to blossom into one of Japan's premier metropolises.

Bibliography

Sources Citied

Primary Sources

——— “63 B-29’s Smashed Over Nagoya Skies In Daylight Skies: 13 Planes Downed, About 50 Damaged, Imperial Headquarters Disclosed.” *Nippon Times* (Tokyo, Japan), Jan. 25, 1945.

——— 朝日新聞社 (Asahi Shinbun[newspaper]). 東京 (Tokyo), 1951年3月1日 (March 1, 1951).

——— “Civilian Pilot on Test Flight Damages One B-29 During Recent Raid Over Nagoya.” *Nippon Times* (Tokyo, Japan), Dec. 18, 1945.

——— “Enemy’s First Air Raid.” *Japan Times and Advertiser* (Tokyo, Japan), Apr. 20, 1942.

——— “Number of B-29’s Hit Surpasses Production: 278 Downed, Damaged in 4 Raids This Month Against January Output of 162.” *Nippon Times* (Tokyo, Japan), Mar. 21, 1945.

——— “Poor Progress Made in Building Houses: Only 271,900 Are Constructed Throughout Country Up To End of July.” *Nippon Times* (Tokyo, Japan), Aug. 16, 1946.

1-1-9 Temperature, Temperature, Precipitation, Sunshine Time (2) (Showa 21 to 1987). Nagoya City Hall. “Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators.” Accessed June 17, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-2-1 Year-to-year comparison of population (Meiji to 1988). Nagoya City Hall. “Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators.” Accessed June 17, 2020-March 15, 2021. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-2-2 Census population (Taisho 9-1985). Nagoya City Hall. “Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators.” Accessed March 12, 2021. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-2-3 Number of households and population before transfer of municipalities transferred to Nagoya City (Taisho 9-Showa 35). Nagoya City Hall. “Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators.” Accessed March 12, 2021. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-2-8 Age 5 years old Population by class (1) Meiji 32 to 1988). Nagoya City Hall. “Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural

environment and basic indicators." Accessed September 5-10, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-2-12 Employed/Unemployed Population (Taisho to 1985). Nagoya City Hall. "Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators." Accessed June 25, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-2-13 Number of Employees by Industry Major Category (Taisho 19 to 1985). Nagoya City Hall. "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators." December 29, 2020, http://www.city.nagoya.jp/somu/page/0000026159.html.

1-2-14 Number of Employees by Industry Major Category (2) (Taisho 9 to 1985). Nagoya City Hall. "Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators." Accessed June 30, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-2-23 Number of arrivals and departures (Meiji 22 to Showa 3). Nagoya City Hall. "Centennial annual ring of Nagoya city (long-term statistical data collection) Part 1 Natural environment and basic indicators." Accessed September 6, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

Adelson, Jeff. "For the 1st time since Hurricane Katrina, Census Stats Show a Shrinking New Orleans." *The New Orleans Advocate* (New Orleans, LA), Apr. 18, 2019.

Coulter, Wesley. "A Dot Map of the Distribution of Population in Japan." *Geographical Review* 16, no. 2: (1926), 1-3.

Douhet, Giulio. *The Command of the Air*. New York City: Coward-McCann Publishers, 1942.

Government of Japan. *General Railway Map of Japan & Manchuria.* [map]. Scale: 1: 1,300,000. Tokyo: Department of Railways, Government of Japan, and Tokyo Tsukiji Foundry, 1917.

今枝新三郎 製圖 (Imaeda Shinsaburo). 名古屋熱田實測圖 愛知縣廳測量 (Nagoya Actual Survey Map Aichi Prefectural Office Survey. [map]. Scale unknown. 名古屋 (Nagoya): 若山文二郎 (Bunjiro Wakayama), 1900.

Joint Chiefs of Staff. *Memorandum of the President, Subject: Authority of the Supreme Commander of Allied Powers*. Washington D.C., United States Government, September 13, 1945, https://www.ndl.go.jp/constitution/e/shiryo/01/023/023_002r.html.

Leake, John. *An Exact Survey of the Streets Lanes and Churches Contained Within the Ravines of the City of London.* [map]. Scale: of feet. London. Lord Mayor Alderman and Common Council of the Said City, 1666.

Members of SCAP and the Japanese Emperor's Cabinet. *The Constitution of Japan.* Tokyo: SCAP, 1947, https://japan.kantei.go.jp/constitution_and_government_of_japan/constitution_e.html.

Mitchell, William "Billy." *Winged Defense: The Development and Possibilities of Modern Air Power*. New York City: G.P. Putnam's Sons, 1925.

Matsuoka, Toshihide. *Nagoya, Aichi Prefecture, Honshu (cartographic material).* [map]. Scale: 1:20,000. Japan, 1930.

三菱重工業 (Mitsubishi Heavy Industries). 三菱重工業株式会礼史 *(History of Mitsubishi Heavy Industries Stock Company)*. 東京, 來京千代丸 (Tokyo, Kikyo Chiyomaru): 三菱重工業株式会礼 [Mitsubishi Heavy Industries Stock Association], 1956.

Nagoya City Public Works Bureau. 名古屋市復興計画1946年 (Reconstruction Plan of Nagoya 1946: After the War Damage). [map]. Scale: unknown, Nagoya: Nagoya City Public Works, 1991.

Network2010. *Nagoya Entire Figure (Early Showa Period).* [map]. Scale unknown. "Nagoya Land Figure of the Early Showa Period." Accessed September 7, 2020. http://network2010.org/showamap.

Network2010. *Nagoya Entire Figure in Meiji 43.* [map]. Scale unknown. "Nagoya Area of the Meiji Era." Accessed September 5, 2020, http://network2010.org/meijimap.

Network2010. *Nagoya in the 8th year of the Showa Era.* [map]. Scale unknown. "Nagoya in the early Showa era 'Mitsubishi Heavy Industries Nagoya Aircraft Manufacturing Co., Ltd.'" Accessed September 7, 2020, http://network2010.org/article/152.

Network2010. *The Full Picture of Nagoya in the 20th Year of the Meiji Era.* [map]. Scale unknown. "Nagoya Area of the Meiji Era." Accessed September 5, 2020, http://network2010.org/meijimap.

Office of Statistical Control. *Army Air Force Statical Digest*. Maxwell, AFB, Alabama: Office of Air Force History, 1945.

Okumiya, Masatake and Horikoshi, Jiro. *Zero!: The Air War in the Pacific During World War II From the Japanese Viewpoint*. Washington D.C.: Zenger Publishing Co., Inc, 1956.

Pepys, Samuel. *Diary of Samuel Pepys*. September 1666. 4 September 1666. The Diary of Samuel Pepys: Daily Entries from the 17th century London diary. Accessed March 12, 2021, https://www.pepysdiary.com/diary/1666/09/.

Roosevelt, Franklin D. "The President Requests War Declaration." Speech, New York City, December 8, 1941. Library of Congress. https://www.loc.gov/resource/afc1986022.afc1986022_ms2201/?st=text.

Shishu. *Southern Nagoya*. [map]. Scale: 1:25,000, City unknown: Shishu, 1947. Accessed February 14, 2021, http://ktgis.net/kjmapw/kjmapw.html?lat=35.166034&lng=136.902948&zoom=15&dataset=chukyo&age=4&screen=2&scr1tile=k_cj4&scr2tile=k_cj4&scr3tile=k_cj4&scr4tile=k_cj4&mapOpacity=10&overGSItile=no&altitudeOpacity=2.

Swenson, Dan. *Hurricane Katrina Flooding: 2005.* [map]. Scale: unknown. New Orleans, LA: The New Orleans Times-Picayune, 2019.

Toyoda, Eiji. *Toyota: Fifty Years In Motion*. Tokyo: Kodansha International, 1985.

Toyota Motor Corporation. *Toyota A History of the First 50 year.* Toyota City, Aichi Prefecture, Japan: Dai Nippon Printing Co., Ltd., 1988.

The United States Army Map Service Chief of Engineers. *Koromo, Aichi-Ken, Honshu, Japan.* [map]. Scale: 1:12,500. Washington D.C., The United States Army, 1945.

The United States Army Map Service Chief of Engineers. *Nagoya Northeast, Aichi-Ken, Honshu, Japan.* [map]. Scale: 1:12,500. Washington D.C.: The United States Army, 1946.

The United States Army Map Service Chief of Engineers. *Nagoya Northwest, Aichi-Ken, Honshu, Japan*. [map]. Scale: 1:12,500. Washington D.C.: The United States Army, 1946.

The United States Army Map Service Chief of Engineers. *Nagoya Southeast, Aichi-Ken, Honshu, Japan*. [map]. Scale: 1:12,500. Washington D.C.: The United States Army, 1945.

The United States Army Map Service Chief of Engineers. *Nagoya Southwest, Aichi-Ken, Honshu, Japan*. [map]. Scale: 1:12,500. Washington D.C.: The United States Army, 1945.

United States GHQ and SCAP Occupational Administration. *United States Initial Post-Surrender Policy for Japan: Part III—Political*. Washington D.C., United States Government, September 6, 1945, https://www.ndl.go.jp/constitution/e/shiryo/01/022/022_003r.html.

The United States Strategic Bombing Survey. "Atsuta Plant, Aichi Aircraft Company.*" Aichi Aircraft Company: Corporation Report* no. v: (1947).

The United States Bombing Survey. "Effects of Air Attacks on the City of Nagoya." *The Effects of Air Attacks on the City of Nagoya*, no. 1 (1947): 4-47.

The United States Strategic Bombing Survey. "Eitoku Plant, Aichi Aircraft Company.*" Aichi Aircraft Company: Corporation Report* no. v: (1947).

The United States Strategic Bombing Survey. "Mitsubishi No. 3 Airframe Works (Plant Report No. 1-3)." *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947).

The United States Strategic Bombing Survey. "Mitsubishi No. 4 Engine Works." *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947).

The United States Strategic Bombing Survey. "Mitsubishi No. 5 Airframe Works." *Mitsubishi Heavy Industries, LTD: Corporation Report* no. I: (1947).

The United States Bombing Survey. "Summary and Conclusions." *The Effects of Air Attacks on the City of Nagoya*, no. 1 (1947): 1-4.

The United States Strategic Bombing Survey. "The Corporation and Its Importance in the Aircraft Industry." *Mitsubishi Heavy Industries, LTD: Corporation Report* no. 1 (1947): 1-17.

Wren, Christopher. *A Plan for Rebuilding the City After the Fire.* [map]. Scale: 1800 feet. London. Parliament, 1666.

Secondary Sources

Adikari, Yogonath and Yoshitani, Junichi. "Global Trends in Water-Related Disasters: an insight for policymakers." *The United Nations World Water Assessment Programme*, (2009): 1-28.

Audefroy, Joel F. "Post-disaster emergency and reconstruction experiences in Asia and Latin America: an assessment." *Development in Practice* 20, no. 6 (2010): 664-677.

Brassard, Caroline and Raffin, Anne. "Resilience in Post Disaster Societies: From Crisis to Development." *Asian Journal of Social Science* 39, no. 4 (2011): 417-424.

Boyd, Gary. "The Vought V-143 1930s Technology Transfer." *Air Power History* 43, no. 4 (1996): 28-37.

Chapin, Captain John C. USMCR (Ret.). "Breaching the Marianas: The Battle for Saipan." *Marines in World War II Commemorative Series* (1994): 1-37.

Coletta, Paolo E. "Launching the Doolittle Raid on Japan, April 18, 1942." *Pacific Historical Review* 62 no. 1 (1993): 73-86.

Comfort, Louise K., Thomas A. Birkland, Beverly A. Cigler, and Earthea Nance. "Retrospectives and Perspectives on Hurricane Katrina: Five Years and Counting." *Public Administration Review* 70 no. 5 (2010): 669-678.

D'Angina, James. *Mitsubishi A6M Zero*. Oxford, UK: Ospery Publishing, 2016.

Department of Military and Engineering. *The War with Japan: Part 1, December 1941-August 1942.* West Point, NY: United States Military Academy, 1950.

Detroit Historical Society. "Willow Run." Encyclopedia of Detroit. Accessed January 7, 2021, https://detroithistorical.org/learn/encyclopedia-of-detroit/willow-run#:~:text=Willow%20Run%20is%20an%20Albert,%24200%20million%20to%20the%20project.

Dingman, Roger. "The Gift and the Dagger: The Impact of the Korean War on Japan." *The Journal of American-East Asian Relations* 2 no. 1 (1993): 29-55.

Dow, S. and J. McGuire. "The Persistence and Implications of Japanese Keiretsu Organization." *Journal of International Business Studies* 34, no. 4 (2003): 374-388.

Dower, John W. *Embracing Defeat: Japan in the Wake of World War II*. New York: W.W. Norton & Company, Inc., 1999.

Dyndal, Gjert Lage. *Trenchard and Slessor: On the Supremacy of Air Power over Sea Power*. Trondheim, Norway: Tapir Academic Press, 2007.

Eiji, Takemae. *The Allied Occupation of Japan*. New York City: Continuum International Publishing, 2002.

Evans, David C. *Kaigun: Strategy, Tactics, and Technology in the Imperial Japanese Navy, 1887-1941.* Annapolis, MD: Naval Institute Press, 2012.

Fiévé, Nicholas and Waley, Paul. *Japanese Capitals in Historical Perspective: Place, Power, and Memory in Kyoto, Edo, and Tokyo*. London: RoutledgeCurzon, 2003.

Flath, David. "Shareholding in the Keiretsu, Japan's Financial Groups." *The Review of Economics and Statistics* 75, no. 2 (1993): 249-257.

French, Thomas. *The Economic and Business History of Occupied Japan*. Ed. Thomas French. New York City: Routledge, 2018.

Grabowiecki, Jerzy. *Keiretsu Groups: Their Role in the Japanese Economy and a Reference Point (or a paradigm) for Other Countries*. Wakaba, Chiba-Shi, Japan: Institute of Developing Economies, Japan External Trade Organization, 2006.

The Great Kanto Earthquake.org. "Land Readjustment: Rebuilding Tokyo from the Ashes Up." The Great Kanto Earthquake.org, accessed March 13, 2021. http://www.greatkantoearthquake.com/reconstruction.html#contest.

Gunn, Simon and Townsend, Susan C. *Automobility and the City in Twentieth-Century Britain and Japan*. London: Bloomsbury Academy, 2019.

Hammer, Joshua. *Yokohama Burning: The Deadly 1923 Earthquake and Fire That Helped Forge the Path to World War II*. New York: Free Press, 2006.

Hampton Mitsubishi. "A History of Mitsubishi." Mitsubishi Motors. Accessed February 17, 2021, https://www.hamptonmitsubishi.com/the-history-of-mitsubishi-in-lafayette-la/#:~:text=1950%3A%20Mitsubishi%20Heavy%20Industries%20splits,and%20West%20Japan%20Heavy%20Industries.

Haulman, Daniel L. *Hitting Home: The Air Offensive Against Japan*. Washington D.C.: Air Force Historical Studies Office, 1999.

Itani, Yoshie. "Export Porcelain from Seto in the Meiji Era." PhD diss., University of Oxford, 2006.

Iversen, Robert Rehner. *Jobs Aren't Enough: Toward a New Economic Mobility for Low-Income Families.* Philadelphia: Temple University Press, 2006.

Izumi, Takeo. "The Cotton Industry." *The Developing Economies* 17, no. 4 (1979): 398-420.

Jansen, Marius B. and Rozman, Gilbert. *Japan in Transition from Tokugawa and Meiji*. Princeton, NJ: Princeton University Press, 1986.

Kates, R.W., Colten, C.E., Laska, S., and Leatherman, S.P. "Reconstruction of New Orleans after Hurricane Katrina: A research perspective." *Cityscape* 9, no. 3 (2007): 5-22.

Kerr, Bartlett E. *Flames Over Tokyo: The U.S. Army Air Force's Incendiary Campaign Against Japan 1944-1945*. New York City: Donald I. Fine, Inc., 1991.

Kostof, Spiro. *The City Assembled: The Elements of Urban Form Through History*. Boston: Little, Brown and Company, 1992.

Kuniko, Fujita. "Corporatism and the Corporate Welfare Program: Impact of the Korean War on the Toyota Motor Corporation" In *The Occupation of Japan: The Impact of the Korean War*. Ed. William F. Nimmo. Norfolk, VA: General Douglas MacArthur Foundation, 1986.

London Fire Brigade. "The Great Fire of London." London Fire Brigade, accessed March 12, 2021. https://www.london-fire.gov.uk/museum/history-and-stories/the-great-fire-of-london/.

Mass, William and Robertson, Andrew. "From Textiles to Automobiles: Mechanical and Organizational Innovation in the Toyoda Enterprises, 1895-1933." *Business and Economic History* 25, no. 2 (1996): 1-37.

Mikesh, Robert C. and Shorzoe, Abe. *Japanese Aircraft, 1910-1941*. London: Putnam Aeronautical, 1990.

Mishima, Yasuo. "The Industrial Revolution in Pottery in Japan—Seto and Nagoya." *Kyoto University Economic Review* 25, no. 2 (1995): 31-49.

Mitsubishi Electric Corporation. "History of Mitsubishi Group." Mitsubishi Electric. Accessed June 20, 2020. https://www.mitsubishielectric.com/en/about/history/overview/group_history.page.

Mitsubishi Heavy Industries. "As Japan Modernizes, MHI Emerges." About Mitsubishi Heavy Industries, Ltd. Accessed June 21, 2020. https://www.mhi.com/company/aboutmhi/outline/history.html.

Mitsubishi Motors. "The History of Mitsubishi Motors: Car History." Mitsubishi Motors. Accessed February 17, 2021, https://www.mitsubishi-motors.com/en/company/history/car/.

Mitsui & Co. "Sakichi Toyoda and Toyota Industries Corporation backed by the former Mitsui & Co." Mitsui & Co. Accessed October 22, 2020. https://www.mitsui.com/jp/en/roots/1209872_7253.html.

Miyakawa, Yasuo. "Nagoya: The Core of Japan's Global Manufacturing Industries." In *Japanese Cities in the World Economy*, 159-174. Eds. Kuniko Fujita and Richard Child Hill. Philadelphia: Temple University Press, 1993.

Network2010. “Nagoya in the early Showa period ‘Mitsubishi Heavy Industries Nagoya Aircraft Mfg. Co., Ltd.” Network2010. Accessed January 9, 2021, http://network2010.org/article/152.

Pike, John. “Ministry of International Trade and Industry.” Federation of American Scientists. Revised September 12, 2003, https://fas.org/irp/world/japan/miti.htm#:~:text=Historical%20Background%3A%20Japan's%20Ministry%20of,restoration%20of%20industrial%20productivity%20and.

Reid, Kathryn. “2005 Hurricane Katrina: Facts, FAQs, and how to help.” WorldVision, revised November 25, 2019. https://www.worldvision.org/disaster-relief-news-stories/2005-hurricane-katrina-facts#:~:text=An%20interesting%20fact%20is%20that,as%202%2C400%20ships%20and%20vessels.

Robinson, Douglas H. *Zeppelin in Combat: A History of the German Naval Airship*. Atglen, PA: Schiffer Military History, 1997.

Ross, Stewart Halsey. *Strategic Bombing by the United States in World War II: The Myths and the Facts*. Jefferson, NC: McFarland & Company, Inc., 2003.

Samuels, Richard J. *Rich Nation, Strong Army: National Security and the Technological Transformation of Japan*. Ithaca, NY: Cornell University Press, 1994.

Saxonhouse, Gary. “Mechanisms for Technology Transfer in Japanese Economic History.” *Managerial and Decision Economics* 12, no. 2 (1991): 83-92.

Schaller, Michael. *The American Occupation of Japan: The Origins of the Cold War in Asia.* Oxford: Oxford University Press, 1985.

Schencking, J. Charles. “The Great Kanto Earthquake and the Culture of Catastrophe and Reconstruction in 1920s Japan.” *The Journal of Japanese Studies* 24 no. 2 (2008): 295-331.

Schwabe, Daniel T. *Burning Japan: Air Force Bombing Strategy Change in the Pacific*. Lincoln, NE: University of Nebraska Press, 2015.

Sherry, Michael S. *The Rise of American Air Power: The Creation of Armageddon*. New Haven, CT: Yale University Press, 1987.

Szczepanski, Kallie. “The Great Kanto Earthquake, 1923.” ThoughtCo., published Dec. 1, 2019. https://www.thoughtco.com/the-great-kanto-earthquake-195143.

Szasz, Ferenc Morton. ““Pamphlets Away”: The Allied Propaganda Campaign Over Japan During the Last Months of World War II.” *The Journal of Popular Culture* 42 no. 3 (2009): 530-540.

Tillman, Barrett. *Whirlwind: The Air War Against Japan 1942-1945*. New York City: Simon and Schuster, 2010.

Togo, Yukiyasu and Wartman, William. *Against All Odds: The Story of the Toyota Motor Corporation and the Family That Created It*. New York: St. Martin’s Press, 1993.

Toyota Motor Company. "Item 2 Occurrence of special demand due to the Korean War." Equipment Modernization, Toyota Motor Company. Accessed February 16, 2021, https://www.toyota.co.jp/jpn/company/history/75years/text/taking_on_the_automotive_business/chapter2/section7/item2.html.

Toyota Motor Company. "Item 4 Supermarket Method." Equipment Modernization, Toyota Motor Company. Accessed February 16, 2021, https://www.toyota.co.jp/jpn/company/history/75years/text/taking_on_the_automotive_business/chapter2/section7/item2.html.

Toyota Motor Corporation. "Toyoda Automatic Loom Works Designates a Licensed Company under the Automotive Manufacturing Industries Law." *75 Years of Toyota*. Accessed September 9, 2020. https://www.toyota-global.com/company/history_of_toyota/75years/text/taking_on_the_automotive_business/chapter2/section2/item7.html.

Vale, Lawrence J. "Restoring Urban Viability." In *Rebuilding Urban Places After Disaster: Lessons from Hurricane Katrina*, 149-167. Eds. Eugenie L. Birch and Susan M. Wachter. Philadelphia: University of Pennsylvania Press, 2006.

Vigdor, Jacob. "The Economic Aftermath of Hurricane Katrina." *Journal of Economic Perspectives* 22 no. 4 (2008): 135-154.

Werrell, Kenneth P. *Blankets of Fire: U.S. Bombers over Japan during World War II*. Washington D.C.: Smithsonian Institution Press, 1996.

Weston, Mark. *Giants of Japan: The Lives of Japan's Greatest Men and Women.* New York: Kodansha America, Inc., 1999.

Yamamura, Kozo. "Zaibatsu, Prewar and Zaibatsu, Postwar." *The Journal of Asian Studies* 23, no. 4 (1964): 539-554.

Yoshimura, Akira. *Zero Fighter*. Westport, CT: Praeger Publishers, 1996.

Sources Referenced

Primary Sources

——— "130 B-29 Bombers Again Blind-Bomb Nagoya City: Explosives and Incendiaries Dropped in Haphazard Attack I.H.Q. Says." *Nippon Times* (Tokyo, Japan), Mar. 26, 1945.

——— "His Imperial Majesty Learns of Exploits Rendered by Endo, Nishio in Smashing B-29's." *Nippon Times* (Tokyo, Japan), Mar. 17, 1945.

——— "Sublieutenant at Base Pledges to Retaliate Against Enemy Bombing of Ise Grand Shrine." *Nippon Times* (Tokyo, Japan), Jan. 18, 1945.

——— "Superforts Will fly Over Former Targets: Peace Will Be Flight Mission On Army Air Force Day, August 1." *Nippon Times* (Tokyo, Japan), July. 24, 1946.

1-1-10 Weather Days (Meiji 22 to 1987). Nagoya City Hall. "Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators." Accessed June 17, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-1-11 Number of Earthquakes by Seismic Intensity (Meiji 24 to 1987). Nagoya City Hall. "Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators." Accessed June 17, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-3-1 Year-to-year Comparison of Citizen's Income (Showa 24 to 1986). Nagoya City Hall. "Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators." Accessed June 17, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-3-2 City Production Income, Net City Production, City Gross Product (Showa 24 to 1986). Nagoya City Hall. "Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators." Accessed June 17, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

1-3-3 Citizen's Income (Showa 24 to 1986). Nagoya City Hall. "Centennial annual ring of Nagoya City (long-term statistical data collection) Part 1 Natural Environment and basic indicators." Accessed June 17, 2020. http://www.city.nagoya.jp/somu/page/0000026159.html.

The United States Strategic Bombing Survey. *Summary Report Covering Air Raid Protection and Allied Subjects in Japan* no. 10 (1946): 1-15.

The United States Strategic Bombing Survey. *Summary Report (Pacific War)* no. 1 (1946): 1-32.

The United States Strategic Bombing Survey. *The Effects of Strategic Bombing on Japanese Morale* no. 14 (1947): 1-256.

Secondary Sources

The Air and Space Power Course. "Douhet's Theory." College of Aerospace Doctrine, Research and Education. Accessed December 28, 2020, http://www.iwar.org.uk/military/resources/aspc/text/theory/douhet.htm.

The Air and Space Power Course. "Mitchell's Theory." College of Aerospace Doctrine, Research and Education. Accessed December 29, 2020, http://www.iwar.org.uk/military/resources/aspc/text/theory/mitch.htm.

The Air and Space Power Course. "Trenchard's Theory." College of Aerospace Doctrine, Research and Education. Accessed December 28, 2020, http://www.iwar.org.uk/military/resources/aspc/text/theory/trench.htm.

Biddle, Wayne. *Barons of the Sky: From Early Flight to Strategic Warfare the Story of the American Aerospace Industry*. New York City: Simon & Schuster, 1991.

Borden, William S. *The Pacific Alliance: United States Foreign Economic Policy and Japanese Trade Recovery, 1947-1955*. Madison, WI: University of Wisconsin Press, 1984.

Boyle, Andrew. *Trenchard: Man of Vision*. London: St. James Place, 1962.

Boyne, Walter J. *Clash of Wings: World War II in the Air.* New York City: Touchstone, 1994.

Chalmers Johnson. *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975*. Stanford, CA: Stanford University Press, 1982.

Clancey, Patrick. "Chapter 2: The Japanese Attack on Pearl Harbor, Planning and Execution." The Campaigns of the Pacific War. Accessed December 31, 2020, http://www.ibiblio.org/hyperwar/AAF/USSBS/PTO-Campaigns/USSBS-PTO-2.html#appendix3.

Cody, James R. *AWPD-42 To Instant Thunder: Consistent, Evolutionary Thought or Revolutionary Change?*. Maxwell, AL: Air University Press, 1996.

Cohen, James B. *Japan's Postwar Economy*. Bloomington, IN: Indiana University Press, 1958.

Cohen, Theodore. *Remaking Japan: The American Occupation as New Deal*. New York City: The Free Press, 1987.

Dension, Edward F. and William K. Chung. *How Japan's Economy Grew So Fast: The Sources of Postwar Expansion*. Washington D.C.: The Brookings Institution, 1976.

Downes, Alexander B. *Targeting Civilians in War*. Ithaca, NY: Cornell University Press, 2012.

Dyndal, Gjert Lage. *Trenchard and Slessor: On the Supremacy of Air Power over Sea Power*. Trondheim, Norway: Tapir Academic Press, 2007.

Eyre, John Douglas. *Nagoya: The Changing Geography of a Japanese Metropolis*. Chapel Hill, NC: University of North Carolina at Chapel Hill, Department of Geography Press, 1982.

Fletcher, W.M. "Co-operation and Competition in the Rise of the Japanese Cotton Spinning Industry, 1890-1926." *Asia Pacific Business Review* 5, no. 1 (1998): 45-70

Fletcher, W.M. "Economic Power and Political Influence: The Japan National Spinners Association and National Policy, 1900-1930." *Asia Pacific Business Review* 7, no. 2 (2000): 39-62.

Forsberg, Aaron. *American and the Japanese Miracle: The Cold War Context of Japan's Postwar Economic Revival, 1950-1960*. Chapel Hill, NC: The University of North Carolina Press, 2000.

Francillon, Rene J. *Japanese Aircraft of the Pacific War*. Annapolis, MD: Naval Institute Press, 1987.

Frowe, Helen. *The Ethics of War and Peace: An Introduction*. New York: Routledge, 2011.

Gorn, Michael H. *Harnessing the Genie: Science and Technology Forecasting for the Air Force, 1944-1986*. Washington D.C.: Office of the Air Force History United States Air Force, 1988.

Harmsen, Peter. *Shanghai 1937: Stalingrad on the Yangtze*. Havertown, PA: Casemate Publishers, 2013.

Harmsen, Peter. *War in the Far East: Storm Clouds Over the Pacific 1931-1941*. Havertown, PA: Casemate Publishers, 2018.

Karan, Pradyumna P. *Japan in the Bluegrass*. Lexington, KY: The University of Kentucky Press, 2001.

Karan, Pradyumna P. *The Indian Ocean Tsunami: The Global Response to a Natural Disaster*. Lexington, KY: The University of Kentucky Press, 2011.

Kosai, Yutaka. *The Era of High-Speed Growth: Notes on the Postwar Japanese Economy*. Translated by Jacqueline Kaminski. Tokyo: Tokyo University Press, 1986.

Matanle, Peter. "Post-Disaster Recovery in Ageing and Declining Communities: The Great East Japan Disaster of 11 March 2011." *Geography* 98, no. 2 (2013): 68-76.

McFarland, Stephen L. *America Pursuit of Precision Bombing: 1910-1945*. Washington D.C.: Smithsonian Institution Press, 1995.

McFarland, Stephen L. and Wesley Phillips Newton. *To Command the Sky: The Battle for Air Superiority Over Germany, 1942-1944*. Washington D.C.: Smithsonian Institution Press, 1991.

Meilinger, Phillip S. "Trenchard and 'Morale Bombing': The Evolution of Royal Air Force Doctrine Before World War II." *The Journal of Military History* 60 no. 2 (1996): 243-270.

Milward, Alan S. *War, Economy and Society 1939-1945*. Berkeley, CA: University of California Press, 1977.

Nakamura, Takafusa. *The Postwar Japanese Economy: Its Development and Structure*. Translated by Jacqueline Kaminiski. Tokyo: University of Tokyo Press, 1981.

National WWII Museum Researcher. "The Battle of Midway." The National WWII Museum: New Orleans. Accessed January 7, 2021, https://www.nationalww2museum.org/war/articles/battle-midway.

O'Brien, William V. *The Conduct of Just and Limited War*. New York: Prager Publishers, 1981.

Overy, R.J. *The Air War 1939-1945*. New York City: Stein and Day Publishers, 1981.

Parton, James. *"Air Force Spoken Here": General Ira Eaker and the Command of the Air*. Bethesada, MD: Adler & Adler, 1986.

Prange, Gordon W. *At Dawn We Slept: The Untold Story of Pearl Harbor*. New York City: Penguin Books, 1981.

Prange, Gordan W. *Miracle at Midway*. New York City: Penguin Books, 1982.

Rockoff, Hugh. *America's Economic Way of War: War and the US Economy from the Spanish-American War to the Persian Gulf War*. Cambridge: Cambridge University Press, 2012.

Schom, Alan. *The Eagle and the Rising Sun: The Japanese-American War 1941-1943*. New York City: W.W. Norton and Company, 2004.

Shapira, Philip, Masser, Ian, and Edgington, David W. *Planning for Cities and Regions in Japan*. Liverpool, England: Liverpool University Press, 1994.

Weisenfeld, Gennifer. "Disaster as Spectacle." In *Imaging Disaster: Tokyo and the Visual Culture of Japan's Great Earthquake of 1923*, 83-127. Berkley, CA: University of California Press, 2012.

Williams, Stewart. "Rethinking the Nature of Disaster: From Failed Instruments of Learning to a Post-Social Understanding." *Social Forces* 87, no. 2 (2008): 115-138.

Y'Blood, William. "Point Luck: The Battle of Midway." *Air Power History* 39 no. 2 (1992): 6-11.