AKRON'S SINGING BRIDGE

A HISTORY OF NORTH AKRON'S HIGH LEVEL CANTILEVER BRIDGE

1942-1949

BY

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The purpose of this paper is to relate the history of the north Akron high level bridge from the early planning stages in 1942 to opening day in 1949.

Introduction

On a sunny Friday morning in July of 1950 an explosion ripped out the center span of the old high level bridge, sending it crashing into the valley below (see figures 1-2, p.13). Hundreds of curious spectators ran for cover as concrete and steel were hurled through the air.[1] Unfortunately, Clarence H. Bartlett, an amateur photographer standing about four hundred feet away, did not duck soon enough and was struck by a piece of concrete one foot in diameter; his injuries proved to be fatal.[2] The Cuyahoga Wrecking Co. of Cleveland, Ohio demolished the thirty-five year old bridge at a cost of $66,000.[3] The explosion signaled the end of the bridge that had served as the main span from Akron to Cuyahoga Falls for thirty-five years. The fate of the old high level, however, had been determined roughly eight years earlier when planning for a new bridge had begun.

Why, then, did state and local government officials feel it was necessary to replace the existing structure? What factors contributed to proving the old high level inadequate? There are several answers to these questions the first of which has to do with the growth of Akron into an industrial metropolis. The original high level bridge was constructed in 1914 primarily to "provide access to the west side of Cuyahoga Falls and to open up new residential territory located conveniently with respect to Akron industries."[4] However, Akron had not yet become the leading manufacturer of rubber in the world; its remarkable rise as an industrial capital was just beginning. Between 1910 and 1920 the expanding rubber industry and World War I contributed to a dramatic boom in the economy and rise in population for the city of Akron.[5] In 1913 the rubber industry employed 22,000 and by 1920 the number had risen to

70,000. Likewise, Akron's population was 69,067 in 1910, grew to 208,435 in 1920 and by 1940 reached 244,791.[6] Perhaps as a result of the economic boom and rise in population, motor-vehicle registrations[7] sharply increased from 181,000 in 1915 to 1,919,000 in 1940.[8] Furthermore, in 1915 automobile loads were light and commercial vehicles like buses and trucks were not used as primary modes of transportation.[9] As time went on the exact opposite became true. Therefore, it would seem that the designers of the original bridge did not foresee the sharp increases in population and bridge usage that Akron would experience in a relatively short period of time. Consequently, the bridge was not designed to handle the vehicle loads and volume of traffic it would need to accommodate in the future.

By the 1940's Akron was the leading manufacturer of rubber in the world and its factories produced fifty percent of the tires in the United States.[10] As a result, the trucking industry grew rapidly and Akron became one of principal trucking centers in the United States.[11] By the end of the 1940's "19 trucking firms had headquarters in Akron . . . and 25 other companies, whose main offices were located elsewhere, also had terminals in the city. Collectively they hauled out of Akron, or brought in, more than 75,000,000 pounds of freight each day."[12] Clearly, then, primary importance had to be placed on maintaining roads and bridges that could handle the weight and volume of this traffic.

The existing bridge's twenty-six foot roadway and two, five-foot sidewalks were inadequate to accommodate Akron's high volume of traffic, but the structural deterioration that had begun almost immediately after the bridge opened was a more serious problem.[13] The original bridge was paved with a wood block pavement,[14] an innovation at the time. It was used primarily to reduce the noise of steel-shod horses and steel wheels. However, rain caused the wood block to expand which in turn allowed water through to permeate the concrete slab below. The water froze in the winter and, through a wedging action, progressively destroyed the concrete.[15] The deterioration of the bridge progressed rapidly through the 1920's and 1930's and it became necessary to restrict traffic to a speed of ten

miles per hour and to place a twelve ton load limit for trucks.[16] There were also serious safety concerns due to the crumbling concrete. The bridge railings were weak and "at one time a loaded bus jumped the curb, knocked a big hole out of the railing, and almost toppled over into the chasm below."[17]

In addition to the deteriorating condition of the bridge and the high volume of heavier traffic, bridge construction and maintenance were limited as a result of the depression and World War II.[18] Both the steel and federal funding needed for new bridge construction were tied up in the war cause. Yet it would seem that by 1944 the federal government could see the end of the war approaching and was ready to re-appropriate funds for the badly needed repair of roads and bridges. Passage of the Federal aid Highway Act of 1944[19] made it possible to move ahead with important construction projects. Due to the war, however, road and bridge improvements were made slowly for several years. In 1946 federal funding began to increase; $14,861,000 in federal aid contracts were awarded in Ohio.[20] The new high level bridge in north Akron was one of the projects given priority. As a result, the project which had begun slowly in 1942 was now all but assured of the necessary funding and the planning was put into full motion.

The Planning Phase

Early in 1942 the Summit County Board of Commissioners hired Wendell P. Brown, a consulting engineer, to conduct a study of the existing bridge.[21] In April of 1943 Brown submitted his report to the Board of Commissioners and his conclusions were compelling enough to rule out any considerations for repairing the existing bridge. He stated that the substructure, i.e. the piers, foundations, arch rings, and spandrel columns (see figure 3, p.14), were in good condition and with minor repairs could be maintained for many years.[22] However, Mr. Brown went on to state that "the deck, cross

beams, sidewalk, sidewalk brackets and expansion joints[23] [super-structure] are badly disintegrated and if this disintegration continues much further in certain vital areas, it will be necessary to close the bridge to all traffic."[24] With regards to making repairs, Brown's conclusion was that the "entire super-structure could be replaced at considerable expense, but . . . the load carrying capacity could in no wise be increased."[25] Increasing the load limit was absolutely necessary due to the extremely heavy traffic loads in Akron at that time.[26] Finally, Brown pointed out that a four lane highway fed into the two lane roadway of the bridge forming a bottleneck. As a result, traffic jams and long delays were a daily inconvenience to motorists. Brown's final recommendation was "that money spent on repairs had best be used toward replacing the bridge with a modern structure . . . [and] that the existing structure be given only that maintenance and repairs necessary to keep it in limited use until a new structure can be designed, financed and built."[27]

Convinced by the report, the County Commissioners proposed the building of a new high level bridge and that the actual construction of the bridge would be a post-war project. It may be that war time shortages of building materials and money, as well as the lack of skilled engineers and workers forced the decision to delay construction. The Commissioners went ahead with the preparation of the construction plans, and in October 1943 awarded the design of the project to Wilbur Watson and Associates (hereinafter Watson), a Cleveland-based architectural and engineering firm.[28] During the next two years Watson prepared preliminary plans for the new bridge. Early in 1944, R.L. Harding, a bridge consultant for Watson, submitted tentative plans for the new structure to Arthur F. Ranney, Summit County Engineer.[29] According to Harding's drawing, the location would be about 150 feet east of the existing bridge because it provided good alignment with N. Main street. The bridge was actually built closer to two-hundred feet from the old structure.[30] Additionally, the old bridge could be used during construction (which it was until opening day of the new bridge) so that traffic need not be detoured.[31] The new bridge would be about twelve feet higher to eliminate

the hazardous dips that existed on both ends of the old bridge. The new design also provided for two 26-foot traffic lanes, "two five-foot sidewalks, and a 4-foot dividing strip, making an overall width of 66 feet."[32] The proposed design was a vast improvement over the existing bridge whose overall width was only 26 feet including its two 5-foot sidewalks.

Ranney approved of the tentative plans and took them to a conference in Columbus at which the new bridge was accepted as a project worthy of immediate attention.[33] The next step was to obtain federal approval for the project. Soon a meeting of federal, state, and county officials was held at which the new high level bridge was approved as a postwar, emergency improvement project. Once approved, Ranney wanted to rush the preparation of preliminary and detailed plans for the bridge. Nobody was certain how long the old crumbling bridge would remain safe for traffic. It seems, however, that the project got caught up in bureaucratic red tape because it was another three years before detailed plans were finalized.

In September of 1945 Watson submitted updated (preliminary) plans to the Board of County Commissioners.[34] Several types of structures were considered for the replacement bridge. The first was a multi-span concrete arch design which was similar to the existing bridge (refer to figure 3, p.14). The concrete arch design was quickly rejected because it was too expensive and also required a large amount of lumber which was in short supply. Additionally, there was a lack of skilled labor of the type required for constructing a concrete structure. Several other bridge designs were subsequently investigated and due to the reasons previously stated were rejected. Finally, a cantilever[35] steel arch design was selected because it was economical, did not require "special erection methods" or skilled workers, and was designed for long life.

Although several key decisions had been made, the planning phase was still moving along slowly. By July 1946 preliminary plans for the bridge were still not approved and very

little of the detailed plans had been completed.[36] The state was pushing for the plans to be completed so that bids for the construction could be taken by Fall of 1946. Consequently, Ranney started urging the County Commissioners to expedite approval of the preliminary plans. Ranney was probably getting a little anxious because the detailed designing of the bridge was the responsibility of the County Engineers Office.[37] The Board of Commissioners eventually approved the preliminary plans but not as quickly as was hoped. Bids were not taken in November, in fact the detailed plans were not completed until the next year.

Detailed plans for the new bridge were completed on April 5, 1947 under the direction of Ralph Van Brimmer, county bridge engineer.[38] The plans were 111 pages long and weighed twenty-five pounds. State and federal highway departments moved fairly quickly to approve the plans. The State in particular had an interest in speedy approval because it wanted to start taking bids by July so that their cost could come from the current fiscal year's bridge appropriation.[39] The bids for construction were received in time and on January 7, 1948 the high level bridge contract was awarded to Bates and Rogers Construction Corp. of Chicago, Illinois.[40] Apparently the award came about more quickly than expected; Ranney along with the other participating agencies were preparing themselves for another long delay when they received word of the award.[41] It may be that after six years of planning and delays Ranney was the most relieved of all. He was quoted as saying "thats [*sic*] the best news I've had in some time."[42]

Cost

Cost estimates for the new high level bridge project changed dramatically from the early planning stages right up to the day the final contract was awarded. The primary reason for the increases in cost seems to be the delay in preparing and approving final plans for the bridge. As was discussed in the planning section of this paper, roughly five years had passed

between approval of the tentative plans and approval of the final detailed plans. Naturally, the price of labor and building materials increased during those five years. In 1943 Watson estimated that the bridge alone would cost $442,000. Based on that figure, the firm agreed to provide complete design and specifications for a fee of $15,470.[43] The total cost of the project, including purchasing right-of-ways on both sides of the river and construction of the approaches, was estimated at $939,600.[44] By April 1946 the estimate was increased a half-million dollars due to the higher cost of steel, other building materials, and labor.[45]

Although five agencies participated in the project, the bridge was funded primarily by three: the Public Roads Administration, State Highway Department, and County of Summit. The Public Roads Administration agreed to contribute fifty percent in federal aid funds; the State Highway department, twenty-five percent; and Summit County, twenty-five percent. Based on the 1946 estimate of 1,500,000, the figures were $657,000 for the Public Roads Administration, $450,000 for the State, and $375,000 for Summit County.[46] These numbers, of course, were subject to change. Once again the estimates went up due to delays in approving final plans. The steady rise in prices for building materials had pushed the new price to nearly two million dollars. Consequently, in October 1947, the state highway department requested Summit county to increase its contribution to $492,500.[47] Ranney asked the Board of Commissioners to pass a resolution for the necessary increase which they did almost immediately. Adjusting Summit county's share of the cost was a relatively easy task for the Commissioners because funding did not depend on tax levies or bond issues. During World War II, the County had built up a bridge fund reserve from gasoline tax and license fees from which the county's share was taken.[48] The cost of purchasing property for the bridge approaches and right-of-ways was included in the county's share of the funding.

Summit county purchased forty-four parcels, thirty in Akron and fourteen in Cuyahoga Falls, for the approaches and right of way[49] at a cost of $185,000.[50] Only two homes, one on the Cuyahoga Falls side and one the Akron side, were in the way of

construction and both were moved intact late in April of 1948.[51] The house on the Falls side belonged to Clyde B. Stodgehill. The United Moving & Erecting Co. of Akron did the job and used an "always level" process. All of the furniture and household items, along with eight-thousand phonograph records valued at twenty-thousand dollars, were left in place during the move. The house on the Akron side was moved about fifty-feet to the south by Madden Movers. The rest of the parcels were vacant lots except for an old Shell gas station at the corner of N. Main and Howard streets which was moved along with the houses.

When the Bates and Rogers Corporation was awarded the contract in January 1948 it was on a bid of $1,933,607. One of the requirements set down by the government agencies involved was that the bid not be more than ten percent over the estimate.[52] The contractor's original bid was $275,607 over the estimate; more than ten percent. The bid by Bates and Rogers included wrecking and removing the old bridge. By dropping that aspect of the job, the bid was reduced by $130,000 bringing it to within ten-percent of the estimate.[53] The job of demolishing the old bridge was sub-contracted to a different company a year later.[54] The lower bid permitted the awarding of the contract and work soon began.

The Workers

Before delving into the actual construction of the bridge, a little information about the people who built it should be presented. Most of the information discovered about the people simply includes names and their relative position or title. First, as mentioned previously, Wilbur Watson and Associates prepared the design plans. T.E. Terry, a partner in the firm, and S.O. Forsmark, chief engineer, supervised the preparation of the plans.[55] During construction C.T. Smith was the general superintendent and M.C. Warmbier was the general foreman; both worked for Bates and Rogers Corp. Harry Hiscott, an employee of the

Bethlehem Steel Co., was the superintendent of erection. During all phases of the project Summit county was represented by A.F. Ranney and Ralph Van Brimmer. The Ohio Department of Highways employed C.M. Newhall as project engineer and William Wardman as division construction engineer.

There is an interesting story behind some of the workers who actually erected the bridge. The majority of the men who did the steel work were Native-American Indians; all were employees of the Bethlehem Steel Co.[56] The men on the Akron side were descendants of the Iroquois and Mohawk tribes and the men on the Cuyahoga Falls side were descendants of the Seneca tribe. There was an actual Seneca chief working among the steel workers on the Falls side by the name of Dick Seneca. A friendly competition had been initiated between the two sides to see who could reach the center of the valley first. Ironically, the tribes on either side of the bridge had been traditional enemies in centuries past. So many Native-Americans worked on the bridge that someone had jokingly chalked on the steel, "Stay off -- Indian reservation".[57]

Building the Bridge

Construction on the new bridge began on February 4, 1948.[58] The work went quickly initially because the bridge had been classified as a "necessary, emergency project" and partly because the contractor had the necessary steel "tied up for the job."[59] By the middle of March, Bates and Rogers Co. was ready to start work on the north abutment.[60] The work was delayed, however, because the home on the Cuyahoga Falls side[61] was in the way of construction. The county had made a provision allowing the homeowner (Mr. Stodgehill) to occupy the property until May 1, 1948.[62] None of the agencies involved wanted to delay construction any longer than necessary. Therefore, Summit county asked Mr. Stodgehill to vacate the house by the 15th of April, to which he agreed and did.[63] After the home was

removed, Bates and Rogers began pouring concrete for the abutments and pier footings.[64] Pouring the nearly five thousand cubic yards of concrete took roughly one month.[65] Work on the approaches began once the pier footings and abutments were complete. On the Cuyahoga Falls side, pavement on State road was torn up in order to move water and sewer lines before paving the new approach. On the Akron side new ground was prepared for the paving of the south approach. Construction moved ahead of schedule, so that by the Fall of 1948 the contractors had already started on the steel erection work.[66]

The steel construction was started on either side of the gorge and moved toward its center (see figure 4, p.15. and figure 5, p.16). Bates and Rogers, the general contractor, sub-contracted the steel work to the Bethlehem Steel Co. which both fabricated and erected the 5,500,000 pounds of structural and 325,000 pounds of reinforcing steel.[67] Work continued rapidly and by the first week of December the steel workers were ready to erect the center suspended span. The construction workers used two cranes to lift two 60-foot sections each weighing 40,000 pounds and held them in position while workmen inserted the drift pins and erection bolts[68] (see figure 5, p.16). For the deck an open steel-grid flooring[69] was used because of its "high strength-weight ratio, excellent drainage, and low maintenance in the winter (see figure 7, p.18)."[70] Automobile tires passing over the bridge surface produced a high whirring sound. As a result, local residents nicknamed the structure the "singing bridge". Unfortunately, one small problem was not foreseen. Due to the fact that salt corrodes iron and steel, salt could not be used to prevent icing during winter. As many local residents can testify, the steel bridge surface became a sheet of ice when the temperature dropped below freezing.[71] The steel work was completed on December 7, 1949. Officials estimated at the time that the finishing date of the bridge would be December of 1949.[72] In reality, the work was completed in July, six months ahead of schedule. The finished product was nine-hundred feet long and 220 feet above the riverbed in the valley below.[73]

Opening Day

The long awaited opening day of Akron's new high level bridge came on Wednesday, July 13, 1949. The day was celebrated as if it were a national holiday. There were official ceremonies, parades, fireworks, and people literally dancing in the streets. Two Akron broadcast stations, WAKR and WADC, carried programs from the bridge.[74] The latter canceled an airing of a Philharmonic Symphony concert in order to broadcast the Governor's address. One-hundred thousand people showed up for the festivities; it was one of the biggest community celebrations in Akron's history.[75]

The ceremonies commenced at 5:30 p.m. with a reception for nearly one-hundred city, county, state, and federal officials at the Mayflower Hotel, followed by a buffet dinner at 6:00 p.m.[76] After dinner the guests were transported to the bridge in order to begin the formal opening ceremonies. Governor Frank J. Lausche was scheduled to cut the red, white, and blue ribbon which would signal the opening of the bridge. However, when the Governor stepped up to the ribbon he stopped and said "I do not feel entitled to cut the ribbon opening this great bridge. The honor belongs to your county engineer, Arthur Ranney. He spearheaded the fight to get the bridge and then saw it through its building, step by step. Mr. Ranney is entitled to the honor ."[77] Gov. Lausche handed the scissors to Ranney who then said, "I dedicate this great bridge to the people of Akron and Cuyahoga Falls and the rest of Summit county." That said, Ranney cut the ribbon and the new high level bridge was officially opened (see figure 6, p.17).[78] Immediately following the formal opening ceremony, the biggest parade since Akron's centennial celebration started across the bridge.

The parade began around 7:30 pm with a caravan of special cars leading the way. The cars carried special guests and government officials (see figure 7, p.18).[79] One of the special guests was Nancy Crites, a 21 year old Kent State student, who had won a popularity contest to be crowned "High Level Queen." In addition to riding at the head of the parade, Nancy

won a one-thousand dollar diamond ring.[80] Just before the parade, the last car drove over the old high level bridge. Three sailors: Joseph T. Gray, Harold Brooks, and A. Leslie Core, drove across the bridge from the Cuyahoga Falls side and immediately afterward police erected barricades officially closing the old structure. However, there is an unresolved dispute as to which car was actually the last one. An employee of the county highway maintenance department, C.H. Bowers, claimed to have driven the last car over the bridge. According to the script, the car carrying the Governor was supposed to be the first car over the new bridge. Actually, the first car to cross after the ribbon cutting was driven by a member of the bridge dedication committee which was preceded by three Akron police motorcycles. The caravan rode ahead of floats, bands, and marching units.[81] All together, the parade was about two miles long and took over an hour to pass by the reviewing stand on the Falls side of the bridge. People were lined up ten deep along both sides of N. Main St.. from Cuyahoga Falls Ave. in Akron all the way to Broad Blvd. in the Cuyahoga Falls (roughly two miles). When the parade was over, thousands of people danced in the street on the Cuyahoga Falls side of the bridge as a fireworks display marked the end of the celebration. People stayed and danced in the street even after the dedication ceremony was finished.[82] Construction engineers said that the bridge would never "undergo such a test of its strength as it did during the celebration. The bridge held four million pounds of weight for several consecutive hours (see figure 8, p.19)."[83]

After seven years of planning and delays, Akron finally had its modern high level bridge (see figure, p.20). The same year that it was opened, the bridge was awarded an "Annual Award of Merit for the Most Beautiful Steel Bridge, Class I."[84]

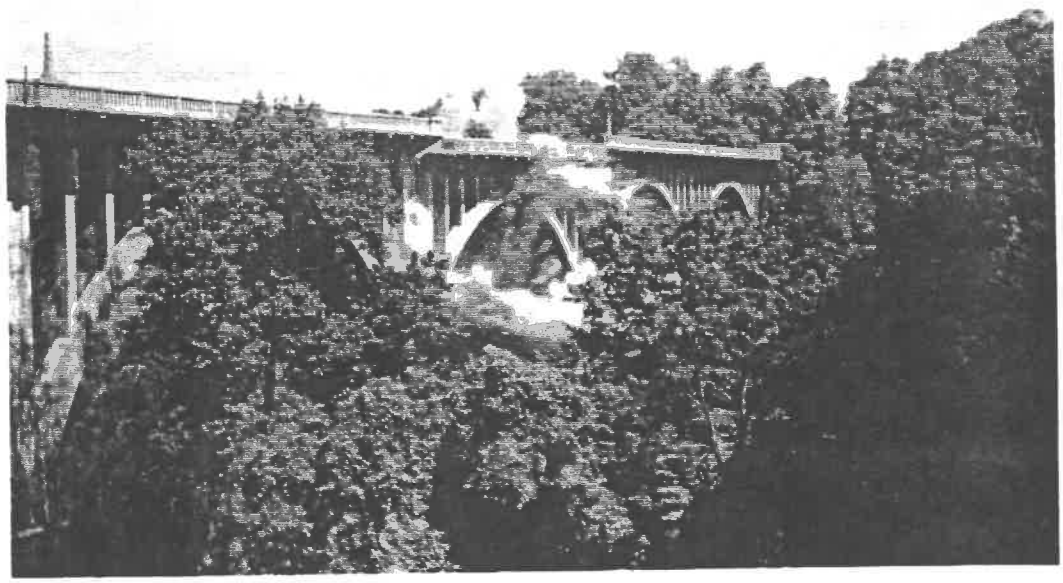

Figure 1. The first of five blasts set of by the Cuyahoga Wrecking Co. in July, 1950. Photograph reproduced, by permission, from Summit County Engineers.

Figure 2. The old high level bridge moments after the center span was blasted to the valley below.